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INDEX TO CONTENTS, PAGE 183. . . . . ADVERTISERS' INDEX, PAGE 22.

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SMITHSONIAN DEPOSIT

Riter-Conley Manufacturing Company

STEEL CONSTRUCTION

Pittsburgh

THE UNITED GAS IMPROVEMENT COMPANY,

PHILADELPHIA.

BUILDERS OF

THE STANDARD DOUBLE SUPERHEATER

LOWE WATER GAS APPARATUS.

ACCURATE MEASUREMENT

OF

AIR AND STEAM SUPPLY

(PATENTED),

AFFORDING { PERFECT CONTROL OF GENERATOR FIRE CONDITIONS.

PRODUCING { UNIFORM RESULTS. HIGHEST EFFICIENCIES.

THE AMERICAN
GAS LIGHT JOURNAL

VOL. XCVI., No. 12. NEW YORK, MARCH 18, 1912. WHOLE NO. 1,919.

CONTENTS.

An Asterisk (*) Denotes an Illustrated Article.

Chemistry for Gas Makers, by "A Londoner"..... 183

Proceedings, Forty-second Meeting, New England Association of Gas Engineers—Continued from Page 148..... 184

First Day, Morning Session—Committee to Nominate Officers—Secretary's Report—Treasurer's Report—Committee on President's Address—Reading Some Correspondence—Report on Nomination of Officers—Election of Officers—Formation of an Engineering Club—Shaving Scrubbers, by Dr. J. F. Wing.

Proceedings, Sixth Annual Meeting, American Gas Institute—Continued from Page 177..... 186

Second Day, Morning Session—Report of Committee—President's Address—*A Survey of American Gas Photometry, by Mr. C. O. Bond.

OFFICIAL NOTICES—

Annual Meeting, Illinois Gas Association..... 190

Fourth Meeting of the Pennsylvania Gas Association..... 190

Fourth Meeting, Southern Gas Association..... 190

EDITORIALS—

Briefly Told..... 190

March Meeting, New England Section, Illuminating Engineering Society—Current Mention

Book Reviews..... 191

Publications..... 191

Proceedings, Fourth Annual Meeting, Indiana Gas Association—Continued from Page 180..... 194

Second Day, Afternoon Session—Report of Nominating Committee—Election of Officers—Some Responses—Report of Committee, Next Place of Meeting—Applicants for Membership—Election of New Members—A Resolution of Thanks—Reminiscences in the Gas Business, by Mr. William Wallace—Mr. Bigelow Speaks—Thanks to the Officers—Final Adjournment

MANAGEMENT AND COMMERCIAL METHODS..... 196

*Graphic Showing, Gas Output by Consolidated Gas, Electric Light and Power Company, Baltimore—The American Meter Company's Prepayment Attachment.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES..... 196

Contracts for the Gas Machinery Co.—The Humphry Company Opens a Philadelphia Headquarters—Mr. A. S. B. Little's Bulletin No. 10—Mr. Aldrich is Injured—Proposing a Gas Plant for Dolgeville, N. Y.—Employees Mutual Benefit Association, Milwaukee, Wis.—Supt. Butler is "on the Job"—The Pension Scheme, Baltimore, Md.—Personal—Cheaper Gas for Tampa, Fla.—Personal—Death of Mr. G. P. Smyser—And Other Items.

The Market for Gas Securities..... 198

Meeting Times of the Various Gas Associations..... 198

Public Lighting Table for March, 1912 (Advertising Section)..... 27

Chemistry for Gas Makers.

[Contributed by "A LONDONER."]

Some weeks ago, in the course of his address as President of the Council of the Society of British Gas Industries, Mr. James Yates declared that it would be difficult to exaggerate the value of chemistry and research work in all branches of gas apparatus manufacture. Without these, it was impossible to be sure of producing gas consuming apparatus that would take up the least possible amount of gas with the greatest amount of duty, and maintain perfect hygienic conditions. Yet unless such an apparatus—not some of it, but all of it—fulfilled these three requirements the value and economy of gas would be misrepresented to the public, and its progress seriously handicapped. The gas apparatus maker must be in constant and familiar touch with everyday needs, and even the fancies and prejudices of the gas consuming public, the defects in apparatus that ordinary daily use revealed, the practical difficulties and limitations of manufacture, and the behavior of particular materials under various conditions of temperature, strain and exposure. His staple materials, such as pig iron, fireclay, enamels, lacquers, should be kept to a uniform standard of quality and correct composition by frequent analysis. He must familiarize himself by adequate tests with the qualities of the various apparatus of different makes that appear from time-to-time on the market, their strong points and their defects.

Although the need of scientific knowledge and method of chemical and research work were of supreme importance and urgency, there was another direction in which the call for these same methods was very little less important; and that was the employment of such plant, machinery, and workshop practice as would insure: First, the production of the apparatus at the lowest price consistent with adequate quality; secondly, that every part of each apparatus would be so accurately made that any number of them should be exactly alike, not varying appreciably in shape or size, thus permitting replacements to be made without any of that expense and trouble of fitting which, in the earlier days, so seriously handicapped the progress of gas.

Another point to which he would respectfully commend the gas apparatus makers was the matter of the technical education of their staffs. If rule-of-thumb were really to yield to rule-of-three, it was obviously of vital importance that the staffs in the various works should be taught to know the accurate methods, and to prefer them to loose and "sloppy" ways. Gas apparatus to-day had really become scientific apparatus, and the draughtsman who made the drawings for it, and the foreman who superintended its construction, should have an intelligent knowledge of the principles on which it was designed, and the way it should work under different conditions. It would pay gas apparatus manufacturers to do all in their power to encourage their staffs to study the technical side of their business, by affording facilities for such studies, and perhaps by offering prizes for proficiency in them. In this connection the speaker could not refrain from expressing regret that so little advantage should have as yet been taken of the great opportunities offered by the establishment of the Livesey Chair of Gas Engineering at Leeds University. The Chair was founded by the gas industry, it filled a real and great want, and it offered the very thing which the industry stood so greatly in need of, still the number availing themselves of the opportunity had hitherto been disappointingly small.

Another needful condition for the development of the industry was that gas apparatus makers should receive the whole-hearted cooperation of the gas undertakings throughout the country. Hitherto the relations between these two branches of the industry had been too exclusively commercial for the best interests of the industry itself. In the natural desire on the one side to buy in the cheapest market, and on the other to sell in the dearest, the ultimate advantage of the gas interest at large, in which both sides had so much at stake, was sometimes overlooked. Makers of gas appliances had too often directed their energies to designing, not the article that would best do justice to gas and popularize its use, but the one that would sell cheapest, or show most "talking points," and so capture a contract; a course which might make for present advantage, but which was bound to yield an ultimate harvest of trouble.

Makers of gas, on the other hand, did not always remember that technical knowledge and scientific methods were things that cost money; indeed, very often money would hardly buy them. And if that expenditure of time and brain and cash was not to be recognized and allowed for, then obviously such efforts would languish under the discouragement, and gas would be far poorer and weaker in the struggle with its rivals than it should be or need be. The matter of price ought not to be made the one-and-only criterion of comparison

in those numerous cases where some of the apparatus being passed under review had scientific research and method behind them while others were without such advantages. The apparatus makers ought to spare no effort to help the gas authorities by so equipping themselves as to be in a position to design the best possible apparatus; the gas authorities ought, in turn, to help the apparatus makers by encouraging their efforts to improve apparatus, and by bearing their fair share of the burdens necessarily created by such efforts.

Incidentally, he would urge, on behalf of gas apparatus makers, that, with highly specialized apparatus, such as was now called for, it was of the utmost importance to have constant conditions as regards the gas, because, with fluctuating conditions, the apparatus could not possibly do its best. The time must come, and that before long, when means would have to be taken to insure higher pressure, constant pressure and constant calorific value. He hoped that the gas makers the-world-over would take this recommendation into serious consideration, because they might be assured that this was rapidly becoming an absolute necessity of the new conditions.

[Official Report Furnished by the Secretary—Continued from Page 148.]

FORTY-SECOND MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Held in Young's Hotel, Boston, Mass., Feb. 14 and 15, 1912.

First Day—Morning Session.

On motion of Mr. C. Miller (seconded by Mr. C. J. R. Humphreys) the Chairman was authorized to submit the address to a committee of three for consideration and report.

The President resumed the chair and appointed as a

Committee to Nominate Officers

for the ensuing year Messrs. W. G. Africa, C. F. Prichard and S. J. Fowler.

The Secy.-Treas. presented reports respecting the business operations of the Society for the past year. The

Secretary's Report

was as follows:

At the last annual meeting there were elected 5 active and 4 associate members.

As stated in the President's Address, there have been four losses by death. There are now on the rolls 5 honorary, 136 active and 101 associate members.

During the year the report of the last annual meeting has been printed and is ready to bind up, with the report of the 42d annual meeting, as soon as it can be gotten into shape by the printer.

A most generous donation of books for the library has been received from Mr. A. B. Slater. Owing to an unfortunate delay in the freight delivery these were not received in time to have them properly arranged at this time. Respectfully submitted, N. W. Gifford, Secy.

[On motion, the report of the Secretary was accepted and placed on file.]

Mr. Gifford then presented the following

Report of Treasurer.

Receipts:		
Cash on hand Jan. 1, 1911	$537.01	
Dues, 1911	885.00	
" 1910	35.00	
" 1909	25.00	
Admission fees	35.00	
Dinner tickets	380.00	
Railroad tickets	148.50	
Progressive Age	102.15	
American Gas Light Journal	70.40	
Sale of "Proceedings"	2.00	
Interest on balances	2.42	$2,222.48
Payments:		
Illustrations	$3.21	
Library	117.05	
Postage	30.40	
Flowers	12.35	
Printing	411.10	
Exchange on checks	0.40	
Expressing	2.45	
Telegrams and telephone	3.89	
Railroad tickets	148.50	
Hotel expense	435.90	
Reporting meeting	140.80	
Publishing "Proceedings"	402.75	
Salary	300.00	$2,008.80
Cash on hand, Dec. 30, 1911		213.68
		$2,222.48

[On motion, the report was accepted and placed on file.]

Vice-President Barnum announced that he would appoint as a

Committee on President's Address,

Messrs. C. A. Learned, F. S. Richardson and W. H. Snow.

Reading Some Correspondence.

The President—Gentlemen, you will listen to the reading of correspondence.

The Secretary—Perhaps, if you will allow me, I will read by title only, and possibly not all of the letters. I have a letter here from Col. Benson, an honorary member and one of the "Old Timers." He first accepted, and later said:

"Since writing you and accepting your cordial invitation to the annual meeting, I have contracted a severe cold, which I find difficult to shake off, and do not dare to add to it by a trip to Boston. I I am much disappointed in not being able to meet my old friends, as I fully expected to do, and egotistical enough to believe they are as disappointed as I am. Please convey to all inquiring friends my sincere regrets, and assure them of my interest in their proceedings and of my appreciation of the honor conferred on me by your kind personal invitation. With kind regards to all, and with the hope that your meeting next week will be in every respect all you could possibly anticipate, I remain as ever, sincerely yours, Fred. S. Benson."

Here is a telegram from Mr. W. R. Addicks, one of Chief Bradley's cordial notes, and a letter from our old friend, Mr. Egner, in which he says:

"If I can come I shall do so; but weather and health will have to be considered these days by me, and so I am not absolutely certain. I have always so much enjoyed being with 'You All's' that you may depend upon my being there unless prevented by unavoidable circumstances."

There are also letters from General Scharff and Messrs. Lewis Lillie, John Williamson, C. W. Hare, Walton Forstall, Henry L. Rice, Sidney Mason, R. M. Searle, G. S. Vincent, A. B. Eaton, W. Cullen Morris, J. H. Jourdan, and probably one or two others. If I may be allowed, while I am on my feet, one thing I would like to speak of at this time, before the discussions of the meeting are started, that the report of all the discussions is taken quite accurately by our experienced stenographer, who knows many of your traits, and will be returned to you to give you an opportunity to see how it looks before going out into the cold world. Our discussions, I think, have been noted for being full and free, and I hope personally, and I presume the President will join with me in hoping, that they will continue so, that you will feel free to dip into the discussions, feeling, as I have said, that you will have a chance to look over your remarks and see how they look. As an added safeguard, the constitution provides that the Secretary shall use his pencil later, if necessary, because sometimes what by itself sounds all right by something else being cut out needs to be changed a little. I speak of this so that we may continue to have the discussions for which the New England meeting has been noted.

Mr. W. G. Africa (Chairman) presented the following

Report on Nomination of Officers.

The Nominating Committee is ready to report. It is the usual custom of the New England Association to re-elect the President for a second term, but Mr. Coffin (for purely personal reasons) found that he could not accept the office for the second term. This the Committee regrets, as probably do also all the members. The Committee is pleased to report as follows:

For President—Mr. D. D. Barnum.
For First Vice-President—Mr. T. H. Hintze.
For Second Vice President—Mr. C. A. Learned.
For Directors—Messrs. H. K Morrison, H. C. Crafts, J. F. Wing, J. A. Norcross and A. M. Barnes. (Mr. Barnes is the new member.)
For Secretary and Treasurer—Mr. N. W. Gifford.

Respectfully submitted, W. G. Africa, C. F. Prichard, S. J. Fowler, } Committee.

Election of Officers.

The President—Gentlemen, you have heard the report of the Nominating Committee.

Mr. Miller moved the report be accepted and that they proceed to an election. [Adopted.]

On motion of Mr. Miller the Secretary was instructed to cast the ballot for the election of the gentlemen named. [The Chair instructed the Secretary to cast the ballot as ordered for the nominees so reported. He subsequently reported the instruction had been carried out and the Chair declared the result.

In response to repeated calls for "Barnum," that gentleman responded as follows:

President-elect Barnum—I thank you sincerely for the honor. I

appreciate it thoroughly. It is indeed a great honor to be President of the oldest Association of gas engineers in this country. I trust the succeeding year will be as prosperous as our former ones. I thank you. [Applause.]

FORMATION OF AN ENGINEERING CLUB.

The President—Under "unfinished business," I think there is a committee on Club. Will the Secretary make the report of that committee?

The Secretary—Mr. President and Gentlemen: During the last two years there has been agitation, and there have been meetings, of representatives of the various engineering societies in and around Boston in regard to the matter of establishing an engineering societies' headquarters. The project was first approached in rather a large way, to include a building with an investment of from 1½ to 2 millions of dollars, but the committee did not find the money and so they rather modified the project. It has resulted in this: That there has been formed and chartered "The Engineers' Club of Boston," and it is possible—I don't know but it is definitely decided, the first annual meeting was held Monday night of this week, but I did not attend owing to press of other business—that quarters will be secured at No. 2 Commonwealth avenue. The building, as proposed, to be changed somewhat, will contain an auditorium seating about 200, which will probably take care of the ordinary meetings of almost any of the Societies. It would be large enough for our meetings. There will be a library, something probably on the plan of the library in the engineering building in New York, of which the library of the Boston Society of Civil Engineers will form quite a large nucleus. If the New England Association of Gas Engineers decides to move with them, and the New England Water Works Association, which now occupies quarters with the Civil Engineers, it will make quite a respectable engineering library. The social club features will be, I suppose, largely by themselves, and a matter of individual choice. It is proposed to have a first-class social club. The limit has been set at 500 active members, 200 non-residents and 50 life members, and the indications are that the list will be filled up reasonably soon. I think at the meeting on Monday night nearly 300 were voted upon. So it seems that the project is going through, and the question will probably arise, before another annual meeting, whether this Association will want to put its library in there, and in so far as it has headquarters make that its headquarters. The suggestion will probably be made that the incoming Board of Directors have authority conferred upon them to act in the matter should occasion arise.

The President—Gentlemen, you have heard the report on club building. Do you think it best at this time to take any action in the matter?

The Vice-President—I think last year it was left in the hands of the Directors, who, of course, cannot take any decided action without reporting to the Association. They can make temporary arrangements during the year, subject to the approval of the Association at its next annual meeting. It would seem as if that would be the best way to leave it this year, because there is nothing that we can decide upon at the present time.

The Secretary—Mr. President, possibly the Association might express its opinion. or the opinion of its members, as to the advisability of such a move in case it should come up. If there is any further information that I have that any of the members want, if they will ask for it I will try and give it.

The President—I trust the members will feel free to express themselves on this matter. Now seems to be the time.

The Secretary—I would like to raise the question as to whether it would not be feasible to authorize the Board to act in case occasion arose. I presume that the Association would be willing, as it will probably not involve the expenditure of a great deal of money, to have the action be final for the time being. I don't suppose we would be committed for all time in case conditions should change and it should become desirable to discontinue the affiliation.

The President—I don't quite understand what action we can take. As I understand it, those of us who are eligible may apply for membership in this Engineers' Club; but do I understand that we can, as the New England Gas Association, become a portion of this Club? Are we at liberty to hire the room if we want to have our meetings there, or just what can we do as a body? What doors are open to us as a body?

The Secretary—As I understand it, the use of the library and a permanent office, if we should ever want to have one, and they have room. The use of the auditorium, for a consideration probably, would be open to this Association if we applied for it. That is, as I understand it, we could practically make use of that as our meeting place instead of this place. There would be certain hotel accommodations, but probably not enough to amount to anything for a gathering like this; that is, as in any social club, where the put-up privileges could be utilized. I do not expect, however, in that present building there will be sleeping accommodations enough for this crowd, but I do understand that the auditorium would be available for us and that would be one of the advantages; that is one of the things that we would look for. As to membership in the Club, it is an individual matter.

Mr. Ramsdell—May I say a word, Mr. President? I think the way that Mr. Gifford made this announcement would give the impression that the New York Societies have a general library. Each Society in the building has its own library.

Mr. Prichard—Is the present Tremont street library to be moved to this engineering building?

The Secretary—If the Association so orders.

Mr. Prichard—I mean, what is there outside of ours?

The Secretary—Yes. The Boston Civil Engineers' Society's library will be the biggest part of the library in the new building; that is, the Civil Engineers will move their headquarters from Tremont Temple to Commonwealth avenue, if the thing goes through as now suggested. In fact, I presume that they will put some of their money into the real estate there.

The President—Gentlemen, have you any suggestion to offer on this line?

Mr. Fowler—What was the vote of last year? How was it left with the Board of Directors to act? I understand from Mr. Barnum the whole thing was left with the Board of Directors last year. If they had absolutely no authority to act, and that is desired, some authority might be given to them; but what was the vote of last year?

The Secretary—A rather loosely worded authority given in a rather informal way. I have not the actual wording of it, but it was left to them without the expectation that any very definite action would be required. Now there is an opportunity probably to say whether the Association will put its library in there as it is now in with the library in Tremont Temple. I don't understand that the ownership of the books will be given up, but probably the project will grow enough so that the library can have more attention and more attendance than it has now. As it is now, the library does not get very much care or attention.

Mr. Fowler—Then, as you made the statement, the thing would seem to resolve itself, in my mind, into this, that the Civil Engineers' library is going to be removed into the new building.

The Secretary—Yes.

Mr. Fowler—The library of this Association is now practically under the charge of the Civil Engineers' Association. If they move out we have got to move out.

The Secretary—We have either to move or do something else.

Mr. Fowler—Or go somewhere else; yes. The proper thing would be to follow them. It seems to me the Directors, under almost any form of vote, would have authority to come to a conclusion on the point as to whether our library should go with the Civil Engineers' library or be removed elsewhere. That is the only question, as I understand it, now before us.

The Secretary—Yes.

Mr. Fowler—It seems to me they would have authority under any vote.

The Vice-President—If the motion is in order, I move that the whole matter be left to the Board of Directors to decide as they see fit. [Seconded, put and adopted.]

The President—We will now pass to the reading of the papers, and will take them as they come if the parties are here and prepared to read them. Will Dr. Wing read his paper on

SHAVING SCRUBBERS?

Dr. J. F. Wing (Everett, Mass.) thereupon read as follows:

The installation of shaving scrubbers in the system for purification of water gas is the logical advance over giving up a large part of the capacity of the purifiers to a layer of material for absorbing tar and moisture in order to protect the oxide. In such a system the shavings could not be replenished until the box was emptied, and the changing of a box was caused more by the drenching of the oxide than by its saturation with sulphur.

Our scrubbers follow the tar extractors, which remove almost all the tarry mist from the gas, which has a temperature of about 90°,

but even then the mist is strong, and, measured by the million feet, carries a great deal of vapor.

The scrubbers are 12 feet in diameter, with 3 stages of dumping trays, and can be filled conveniently with 2 feet in each layer, requiring 500 bushels of shavings. We empty the whole scrubber at each change, because, by the time the top layer is considerably wetted, the back pressure is high. The shavings are planer chips, and they should be coarse, else with a large make the layers must be thinner or changed oftener.

We change a scrubber after a make of about 40 million cubic feet through it. When it is opened about a barrel of oily water drains from the saturated shavings. The changes are usually 2 to 1 of a purifier, and to accomplish the same scrubbing, twice as much shavings would have to be put in a purifier, then all the nastiness would be at the bottom of a deep box, and, until this is opened, the condition of the scrubbing material is conjectural. In the separate scrubber, we have the tests of the pressure and of the gas which has passed to determine the necessity for changing.

When the daily make is 4 to 5 millions to a scrubber, the back pressure may be from 2 to 8 inches, according to the condition of the material. On dumping the trays, the soaked shavings may cling to them, and we find it helpful frequently to wash them with a hose.

In order to obtain some data about the condition of the gas and the efficiency of the scrubbing, Mr. Baker has determined the excess vapor in the gas at the scrubber inlet, after it had travelled 165 feet from the tar extractors, and at another time, but with all the conditions apparently the same, at the outlet of the apparatus:

Excess vapor at scrubber inlet.....1.13 pounds per 1,000
" " outlet... 0.30 " "

Removed by passing the scrubbers, 0.83 pounds per 1,000, of which 0.7 pound was water and 0.13 pound was tar. These amounts, recalculated for 36 millions' make, or the amount for changing a scrubber, give, for the excess moisture entering the purifiers, 10,800 pounds; and, extracted by the scrubbers, 25,200 pounds water and 4,680 pounds tar, a total of 29,880 pounds. The excess going to the purifiers (10,800 pounds), which contained no measurable amount of tar, would not have much effect on a box filled with 250 tons oxide. A test on a large scale has confirmed these figures for the extraction of vapor:

In one case 500 bushels shavings gained 7,811 pounds.
Another lot... .... 8,068 "
or 16 pounds per bushel.

The drip collected from this apparatus during a make of 36 million was 17,400 pounds, 6 per cent. tar, which, added to 8,068 pounds in the shavings, makes 25,468 pounds. Therefore, the scrubbers prevented 707 pounds per million from entering the purifiers and proved their usefulness.

(To be Continued.)

[Continued from Page 177.]

PROCEEDINGS, SIXTH ANNUAL MEETING, AMERICAN GAS INSTITUTE.

Held in St. Louis, Mo., October 18 to 20, 1911.

Second Day—Morning Session.—Section A.

The Report of Committee on Next Place of Meeting,

was then read by Mr. E. G. Pratt as follows:

Mr. President and Gentlemen: The Committee on Next Place of Meeting unanimously recommends Atlantic City, N. J. [Report accepted, on motion of Mr. Gartley, seconded by Mr. Fogg.]

Mr. A. C. Lathrop presented this

Report of Committee on President's Address.

Gentlemen—The President's Address, as was expected, is full of good thoughts, and while no recommendations are contained in it that require any direct action of the Institute, still there are a number of suggestions which should be given especial attention.

He points out the fact that control by State commissions need not have all the disadvantages frequently attributed to it, if the commission be composed of reasonable men of sufficient business experience to understand the problems which confront the business.

All of us have undoubtedly been disturbed by the growth of awards in damage cases, and will welcome any proper safeguard which can be put around our affairs which will put public service corporations on a par with other lines of business.

The President brings out very forcibly the good work which has been done by this Institute by showing, among other things, that, but for the Institute, there would be practically no text books on American Gas Engineering.

The benefits of co-operation between companies, not only in the same State, but in other States, is well brought out.

Whether the Institute should attempt original investigation or not, or should leave it to others to determine, should be given proper consideration.

We are so accustomed to look, or perhaps hope, for large growth in our business that it seems almost revolutionary to suggest that there is no necessity or good to be accomplished by increasing the treasury balance and membership lists of the Institute by taking in new members, at the same time a body such as this Institute gets little or no benefits from an inactive, disinterested membership.

Alanson P. Lathrop, James W. Dunbar, } Committee.

The President then introduced Mr. C. O. Bond, of Philadelphia, Pa., who prefaced his paper on

A SURVEY OF AMERICAN GAS PHOTOMETRY,

by remarking that it was hardly right to call this a survey of American gas photometry, in that it was rather a resume of things left undone on the subject of photometry. The paper is divided into three parts. They had been entitled to representation on the International Photometric Commission, and representatives had been appointed. There had been three meetings of that Commission, but the Institute had not yet had a representative present. He, therefore, placed in the first appendix a short account of the three meetings. Mr. Bond then read the paper proper as follows:

In response to a letter from the Chairman of the Technical Committee, asking for a paper on photometry, with the inference that information was desired as to the work of the International Photometric Committee, which met in Zurich for its third session in July last, I have prepared the following paper in three parts:

A. Remarks as to the International Committee on Photometry.

B. Collecting the "unfinished business" that has been left from other papers on gas photometry before this Institute.

C. The present status of gas photometry in the United States.

(*A.*)—*The International Committee on Photometry.*—A subject of such importance merits recognition well beyond the limits of a personal contribution. It is unfortunate that our American delegates have not been able to attend the sessions of the International Photometric Committee, for through their reports this Institute would have kept in closer touch with foreign thought on matters concerning our industry. The importance of the subject matters dealt with, and the high standing of the engineers and scientists comprising the International Committee, would make such reports valuable indeed to the members of this Institute.

To instance several of these papers there may be mentioned one by Mr. Charles Carpenter, detailing the development of the Metropolitan No. 2 burner; the classical researches by E. Sainte-Claire Deville, on the relation between heating value and luminosity of gas; and the three National Laboratory Comparisons of Standards of Light, to which credit must be given for stimulating the investigations which have led up to the proposed international candle.

In Appendix I. will be found a brief account of the formation and work of the Committee thus far—sufficient, I think, to warrant instructions to our new delegates to prepare a full report of the three Zurich sessions for insertion as an appendix in the Institute Proceedings. I hope such a motion will prevail.

Through an increase in the size of the International Committee, America is now entitled to 3 delegates, with the recommendation that they be appointed early in order to permit of prompt organization for research and other work. A yearly progress report from these delegates would be helpful.

(*B.*)—*Unfinished Business.*—I find, in reviewing the 5 volumes of the Institute "Proceedings," that communications having a bearing on photometry have been made by Messrs. Doty, Lansingh, Gartley, Hyde, Litle, Macbeth, Bond and Bradley. While much of a definite character has been accomplished by, or as a result of, these communications, yet there are at least two unfinished subjects of such importance as to warrant again calling the attention of the Institute to them. These subjects are:

(1) A discussion of the calorific test and the photometric test as a criterion of gas quality.

(2) Discussion upon a standard test burner.

(1) *Calorific or Photometric Test?*—As stated by President Bradley, in his address at the 1910 convention, this is perhaps the question of greatest importance now before the gas industry. At the beginning of the industry (England) gas was supplied for the purpose of giving light only, and the criterion of its value was the sufficiency of illumination received from it, as compared with the illuminant which it tended to supplant—namely, candles. It was found that a flame of convenient, usable size consumed about 5 cubic feet of gas per hour, which rate for testing purposes was arbitrarily fixed. The style of burner in common use was adopted also for a test burner; thus the method of test became such that, in effect, the consumer was sold the equivalent illumination which he had earlier paid for. This was much like selling light; it was rated in *candle power*. It can be seen by this method, as the efficiency of the light transforming devices increases that, for an equal illumination, the gas sold decreases. This decrease of consumption for equal illumination has several times been experienced, as there have come into use the Argand, the regenerative and the incandescent burner. That there has not been a consequent decrease in gas consumption for lighting was due to the fact that more lights, and lights of higher candle power, were used, because the average consumer's premises were insufficiently lighted.

As the days have passed this dearth of light has been more and more corrected. We now know when the illumination is sufficient and we stop there, and the cry to conserve natural resources makes it right that we should stop there. So it cannot much longer be hoped that the loss of consumption through rising efficiency in the *light*

transformer will be offset by persuading the consumer to use more light than he really needs, It is well to recall at this point that, during the transition in England from self-luminous to incandescent lamps, for the several years preceding 1907, the gas output was stationary, and even in some towns decreased.

Reference may be made also to "Bulletin No. 9," of the National Electric Lamp Association, by the Chief Engineer, S. E. Doane (published 7-30-'09), entitled "The Conservation of Our Natural Resources Through the Use of High Efficiency Lamps." He notes a similar reduction in electrical energy output due to the advent of the tungsten lamp, but welcomes the conservation, and sets about divising a way by which both the producer and consumer are bene fitted, utilizing the principles of "Fixed Charges for Fixed Expenses."

In order to indicate the progress made in bettering our *light* transformer, I give here diagrammatic curves, Fig. 1, showing, in the

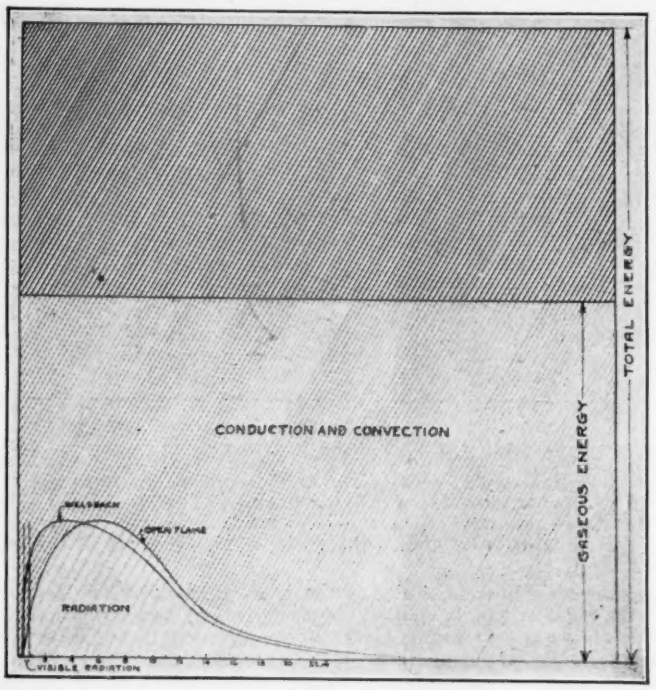

Fig 1

minute white areas, the proportions of the total gaseous energy which go to the production of radiation within the visible spectrum; (1) With a normal incandescent lamp; and (2) with an open flame burner. The first is about 0.31 per cent. and the second 0.082 per cent.; for if all the energy of gaseous combustion should be converted into radiation within the visible spectrum there would result about 106 lumens, or 8.5 mean spherical candle power, per B.T.U. per hour.

The normal lamp mentioned (chosen because of its common use throughout the country) is shown in Fig. 2, and is the bare unit without accessories. The mantle used as a standard, Fig. 3, has the following characteristics:

Mesh per square inch	26 × 26
Projected luminous area	1.97 sq. in.
Total surface area	6.66 sq. in.
Volume	1.935 cu. in.
Weight per sq. in. luminous ash	0.0688 gram.
Total weight luminous ash	0.46821 gram.
Material	Artificial silk.

The average efficiency of this lamp, over the period from June 22 to August 26, 1911, was determined under the conditions below:

Number determinations	32
Gas used	(Mixed coal and water)
B.T.U., average	646
Specific gravity, average	0.674
Consumption, average	3.40 cubic feet.
Pressure	2.5-inch.
Liters water vapor per cubic meter dry air	15 to 28
Lumens per B.T.U. per hour, average	0.34
Lumens per B.T.U. per hour, least	0.313
Lumens per B.T.U. per hour, highest	0.355

On a single test made for temperatures the following results showed:

Volume, free flame	2.128 cubic inches.
Average temerature, free flame	2,979° F. (Abs.)
Average temperature, mantle	2,352° F. (Abs.)
B.T.U., per hour 0.1 gram luminous ash	515

The open flame burner used was the 8.foot E. H. lava tip.

Let us suppose that some impregnating fluid is discovered, or a temperature produced which raises the best efficiency of mantle burners 4 times; or to, say, 2 per cent. What will be the result? If one-third of the present gas output is for lighting, then it would mean a reduction of gas output by about 25 per cent.; a conservation to be proud of, but which would also effect a 25 per cent. reduction

Fig. 2.

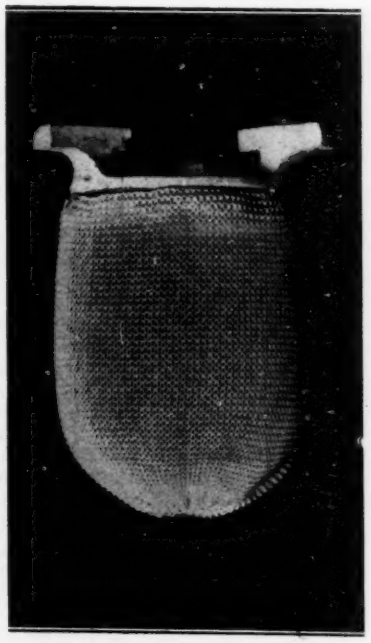

Fig. 3.

in receipts. There will be, without any doubt whatever, a steady increase in the total lumen hours by the use of gas; but it is to be hoped also that there will be a rise in the luminous efficiency shown, even though it should reduce the gas consumption.

In the foregoing discussion the gas industry has been viewed chiefly from the standpoint of a furnisher of light, which it started out to be. If, on the other hand, our conception of the gas industry is that, taking nature's energy in crude form, it has for a primary aim to make the highest obtainable percentage of it available and instantly deliverable for use in a satisfactory gaseous form, and if our only aim is to determine how successfully this is done, then this energy-conversion should be tested by a scientific instrument highly efficient, in order that we may accurately know the efficiency of our conversion from the original coal. The calorimeter, which has an efficiency of 99.5 per cent., answers this requirement. The fact is, gas is valuable for heating, for power and for incandescent lighting in accordance with its calorific content, and if it were not for the fact that a portion of the gas supplied is still used in open flames, the calorimeter would be, logically, the only instrument of test.

The energy in coal gas, through the use of vertical retorts and the by-product coke in water gas generators, is to-day about 58 per cent. recoverable as gaseous energy (though at a B.T.U. content per cubic foot of about 450) which is not a poor conversion. This gaseous energy, when applied to a good commercial heating device, averages 80 per cent. utilization; when applied to the production of power, from 25 to 30 per cent.; and when applied through the mantle to the production of light, ½ of 1 per cent. From these figures it is easy to predict at the beginning of this century of conservation and efficiency the direction of the growth of output.

It was suggested that I write to several of the European countries and find the present attitude there towards the change from the photometric to the calorific test. I did so, and the results are shown in Appendix II. As the International Photometric Committee, with delegates in attendance from these same countries and representing these same Gas Associations, met in Zurich, July, 1911, and discussed this subject, their views will also be of interest.

Dr. Eitner (Germany) stated that the substitution of the calorific test would be effected gradually. They have begun to allow a gross calorific value of from 5,000 to 5,200 calories per cubic meter (531 to 533 gross B.T.U. per cubic foot), the illuminating power being from 10 to 12 Hefners per 150 liters (9 to 10.8 candles per 5.3 cubic feet).

Dr. Colman (England) stated that the English engineers were not opposed to the introduction of the calorific power test, but were opposed to a dual test.

M. Deville (France) strongly urged the replacing of the examination of illuminating power by that of calorific power. (It will be remembered that this substitution has been his concluding argument in his series of valuable papers before the Committee.)

Dr. Strache (Austria) stated that in his country they had begun to accept the gross calorific power. He proposed that the International Photometric Committee recognize the *heat of combustion* as a fundamental measurement, and that the illuminating power remain outside the resolutions, as the gas is used for lighting, heating and power.

Thereupon the President appointed a sub-committee to consider and report upon this question, the Committee consisting of Messrs. Deville (France), Eitner (Germany), Weiss (Switzerland), and Colman (England).

The Committee as a whole, however, expressed its opinion: "That, having regard to the methods of employing gas at present in vogue, the determination of the illuminating power of gas flames has lost its significance, and that the determination of calorific power ought to take the place of the determination of illuminating power as the essential criterion of the value of gas."

(2) *Standard Test Burner.*—If the self-luminous, flame-horizontal candle power of gas is to be retained in America as a method of test, it is high time that definite approval be given by this Institute to some form of test burner. We can well observe the action of the Canadian Gas Association in this matter.

It was thought desirable by that Association to place the testing of gases in Canada upon a uniform national basis. The Association Executive accordingly sent delegates to the Government at Ottawa who conferred with the proper authorities and secured the sanction of the Government for the general use throughout Canada of the Metropolitan No. 2 burner. A similar result at Washington would seem possible if this Institute really desires to continue the photometric test and is ready to act.

In the discussion of a standard test burner we should remember, however, that thus far the horizontal candle power only has been used as a test, and the progressive design of the test burner has been, whether intentional or not, towards increased light in that plane. Had the efficiency of these burners been judged on the basis of the mean spherical candle power, or had a rich gas been used during the testing out, the design might have proceeded along somewhat different lines.

I give herewith distribution curves in a vertical plane of the light

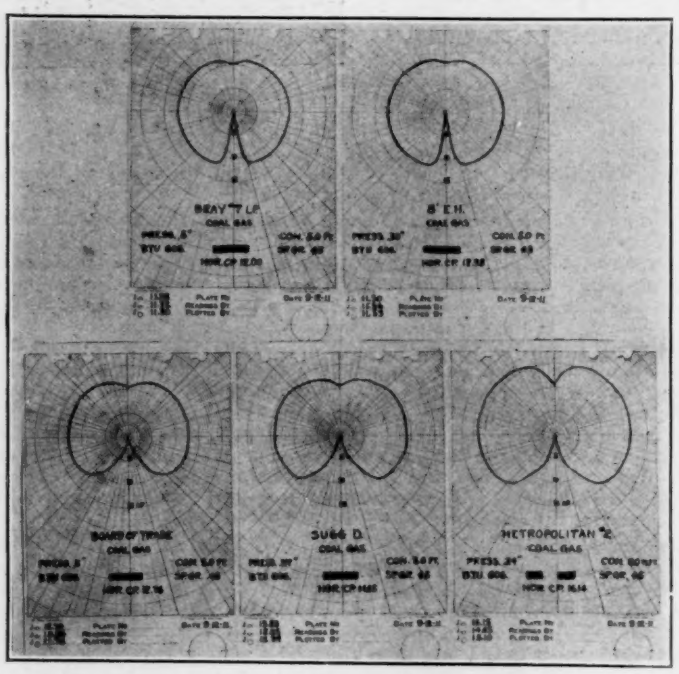

Fig. 4.

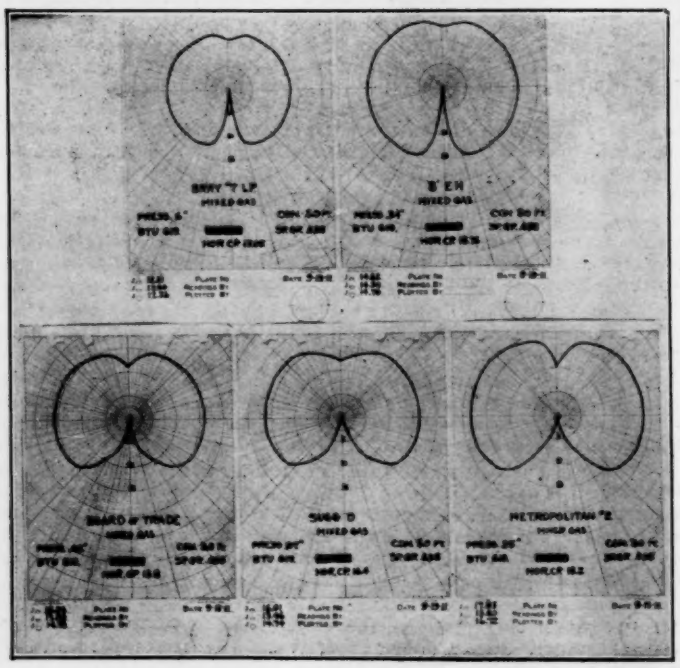

Fig. 5.

from several burners which are, or have been, used for testing purposes, together with the results in terms of mean spherical candle power (Figs 4, 5 and 6). It can be seen that the flat flame burner is

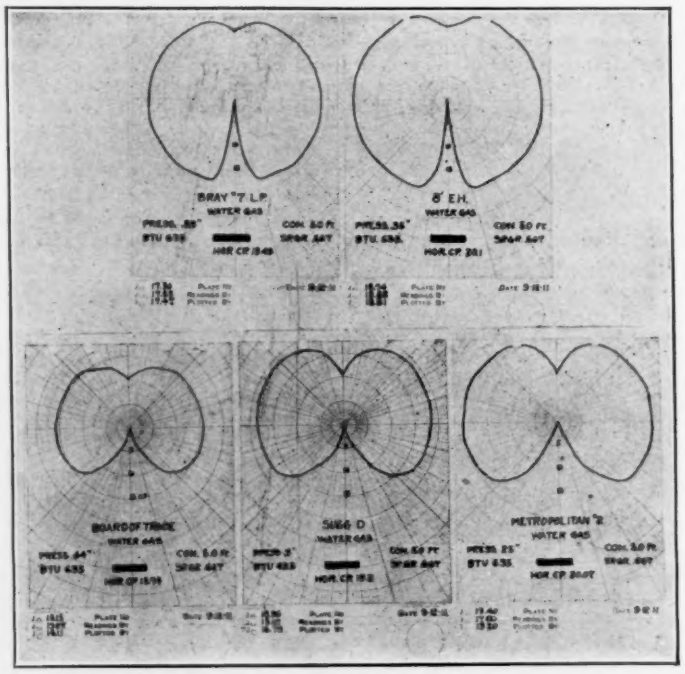

Fig. 6.

almost a spherical distributor of light, while the Argand flame, glass inclosed, elongated and locally raised in temperature, shows curves bulged somewhat more favorably for horizontal candle power. The old, flat flame test burner, in the days when such burners were in practically exclusive use, was, therefore, a fair criterion of the total flux of light.

The Carpenter burner, which is the most efficient of its class, particularly for coal gas, has an accurate control of the air supplied to the flame. I quote from Mr. C. H. Stone, formerly of the New York State Public Service Commission:

"And now the question immediately arises, why should not this burner (Carpenter) be employed in every case, at least for coal gas? The answer to this will be found in the consideration of two or three facts. In Massachusetts the law requires that the gas shall be tested with the burner best adapted to it, which is at the same time practical for use by the consumer, and the authorities in that State have interpreted this to mean a burner which is not only satisfactory in its mechanical details, but which in cost is within the reach of everyone, The price of the Metropolitan No. 2 burner is $25, and this would seem to place it beyond the reach of most consumers."

Right here is a fallacy in argument. Since higher efficiency burners came in, there has been little thought, I take it, that the photometric test exactly measured the *quantity* of light which the consumer could get. The photometric test was regarded as a *qualitative* measure of the gas, and the aim was to hold that *quality*, however measured. Such a measurement should be made, and the quality should be held through a scientific burner, whatever its cost. You can pace off a plot of ground as a provisional measurement, but if a standard measurement is desired a surveyor's instrument and a steel tape are not too expensive to requisition for the purpose. Nor would you for a test calorimeter use a commercial water heater.

It may be seen, from Fig. 6, that the Carpenter burner for the richer gases gives no more light than the open flame. This is because its dimensions are not correct for the richer gases, it having been designed more particularly for coal gas. Another standard test burner, adaptable to gases from 16 to 26 candles, should be specified, therefore, for that range. The points to be made are that the test burner adopted should be scientifically designed, exactly constructed and uniform the country over for similar gases. We should then be able to satisfactorily compare results, and the public could then be assured that year-after-year the photometric quality of the gas was unchanged.

While purely academic, and perhaps of little practical value, we still may speculate somewhat upon another form of test burner which would furnish a criterion, not only of the actual light received by the consumer, but also of the total energy in the gas. Such a test burner would be *ideal* if it were 100 per cent. efficient in transforming gaseous energy into light and it would be even *satisfactory* if the transforming efficiency simply remained constant.

Now, Mons. E. Sainte-Claire Deville's researches at Paris, repeated by and practically concurred in by Dr. Max Mayer, at Karlsruhe, claim a practical constancy of the ratio existing between the calorific value and the absolute incandescent value of luminous gases within the ranges of manufacture; and the calorific value represents the total energy in the gas.

The term "absolute" lighting value is the maximum horizontal candle power per cubic foot per hour obtainable, the burner being

supplied with dry air and saturated gas at the same temperature and pressure. It is no doubt true that a constant relation exists between this horizontal candle power and the mean spherical candle power. Therefore, if the findings are true, and we sought such a test, we might advocate for testing purposes an incandescent mantle burner of current high efficiency which fulfills the conditions above named for a *satisfactory* test burner, the cost of which at the same time is within the reach of everyone, and in using it we should determine the "absolute" mean spherical candle power.

(C) *Gas Photometry in the United States.*—Whatever the future may have in store for gas companies we must recognize the fact that, owing to existing franchises and contracts, a very large proportion of the gas used in this country must still pass a photometric test. There must be photometrists connected with the companies capable of accurately making such tests, and there must be well standardized apparatus with which they may work. As to light standards we can say, with more confidence to-day than ever before, that the pentane lamp is more likely to be a satisfactory primary flame standard than any other, and that the Bureau of Standards, at Washington, have investigated thoroughly this lamp and they hold to-day a high opinion of its reliability. Compared with its only serious rival in the field of primary flame standards—the Hefner lamp—I find in the valuable contribution of Messrs. Rosa and Crittenden, of the Bureau of Standards (I. E. S. T., 1910), the following:

"Its higher candle power, steadier flame and better color are very great advantages. As to reproducibility, a given pentane lamp is more accurately reproducible than a Hefner lamp, when both are operated under correct conditions, but there is a greater difference among different pentane lamps than among different Hefners."

And in the discussion Mr. Crittenden states his difficulty at first in operating a pentane lamp as satisfactorily as a Hefner, but adds: "But we have rather reversed our opinion. We are now glad to work with the pentane and get away from the Hefner."

The paper states further: "That the errors belonging to the *flame standards themselves* could be so small, when measured in all kinds of weather, with a wide range of humidity and temperature, and considerable range of barometric pressure, with many resettings of the lamp, and over a period of some months, would not have been thought possible a year ago."

The correction formula now used by the Bureau for the pentane lamp is:

$$I = I \{ 1 - 0.00567 (e - 8) + 0.0006 (p - 760) \}$$

Where I is the measured candle power in international candles of the pentane lamp under the atmospheric conditions; I_n is value of lamp under normal atmospheric conditions; e is liters of water vapor per cubic meter of dry air, using the Assmann hygrometer; and p is barometric pressure in millimeters. It is strongly recommended that pentane lamps be evaluated and certified by the Bureau of Standards. As to the other essentials for accurate photometric testing for gas, there is no text needed beyond what is already found in the American Gas Institute "Proceedings." I believe, however, in this matter there is an insufficient consulting of those volumes. Partly owing to the influence of the Illuminating Engineering Society, partly to the epochal studies in radiation in recent years, the subject of photometry has grown out of its former modest and primitive domain. Gas men have been acting all these years as if the photometer were simply one more piece of apparatus in the gas plant, like a condenser or a meter dial, to be knocked about and damned if it did not produce what we expected. We have suddenly awakened to the fact that the real photometer is that precious possession—the human eye—and the intermediaries of mirrors, graduated arcs and test plates are being called into requisition by the eye in the fight for its rights. There is need. If this statement is doubted, call in the ocular testimony from the children of the public schools. It is for this reason that "Societies for the Conservation of Vision" are now being founded. No doubt half the retinal harm is done under natural light, but that does not discharge our obligation to present blameless our quota of artificial light; for while the child both studies and recites by day, at night there is study only; and we furnish the light by which that study occurs.

Every manager of a gas industry should be as familiar with the term "foot candle" as he long has been with the term "candle feet." The "candle" in "candle feet" has become habitual, and is to the gas manager simply part of his "yield" for the day—regarded as a physical, commercial quantity. The "candle" in the term "foot candle," on the other hand, is the physiological measure of his service to those whom he essays to "light,', and should involve the element of quality as well as quantity.

It seems plain, then, in the gas industry the photometer must widen its area of usefulness, leave the gas works and begin to travel. Conditions are reversed, and instead of the eye coming to *it*, the photometer must travel *for* or *with* the eye. There must be radial photometers, traveling over the surface of imaginary luminous spheres, or else surrounding them as does the integrating sphere, and there must be illuminometers (portable companions of the eye), by which the success or failure of a lighting installation may be measured and valued *in situ*.

Progressive gas undertakings are buying both kinds for use; and who will doubt that business will be easiest held and increased by those who call in the aid of science, and are prepared to give visible backing to their arguments. As of old, "Seeing is believing."

But this kind of photometry almost at once leaves behind the open gas flame; it becomes incandescent gas photometry, and new difficulties are presented. This was the cause of forming the International Photometric Committee. At least two most valuable conclusions have been reached through the efforts of that Committee, as remarked earlier in this paper: (1) A common unit of light intensity; and (2), the establishment of a practical relation between the calorific and incandescent lighting value of gas. The first you may make use of by having your pentane lamps calibrated and certified in international candles at Washington. The second helps, because whatever artificial illuminating gas we use, we feel that, by rating a lamp or a mantle in terms of "lumens per B.T.U. per hour" we have a tangible efficiency factor. The other variables in incandescent gas photometry are so numerous that I will ask leave to make a separate paper on the subject to be presented at next year's meeting, if it is desired, as this paper is sufficiently long.

The Chairman of the Technical Committee has no doubt been disappointed in his expectation of a highly technical treatment of the subject; but it seems to me the gas industry to-day is not so much in need of mental "nuts to-crack" (photometrically speaking), as in need of a general stirring of the rank-and-file with the determination to put into use the results already laid before them by the new photometry. There must be a deepening of the sense of moral obligation, so that when a consumer places his confidence in us, asking for *light*, we shall requite him not with flickering flame nor blinding glare; but the best we know, and placed with care.

APPENDIX I.

[Largely extracted from Proceedings of the Institution of Gas Engineers.]

The International Photometric Committee came into existence through the following proposal, 4th of September, 1900, at the hands of the International Congress of the Gas Industry, which met that year in Paris, during the Universal Exhibition.

"The International Congress of the Gas Industry, considering that it is in the general and common interest of manufacturers, as well as consumers, of gas to have exact information on the illuminating power of burners used for incandescent lighting, *Resolves*, That an International Committee be appointed with the object of determining the rules to be followed in photometric observations on incandescent gas burners. The Congress executive is authorized to proceed with the organization of this Investigating Committee."

Accordingly it was decided to form the Committee with 18 members, 4 each from France, Germany and England (due to their having national light standards) and one each from Austria Belgium, United States, Holland, Italy and Switzerland. The presidency of the Committee was given to Monsieur Th. Vautier, of France, who still retains it. The organization of the Committee had so far proceeded as to hold its first session (June, 1903) at Zurich, Switzerland, where was promulgated the programme of its work in a list of seven questions, as follows:

(1.) *Incandescence.*—Explain the existing ideas on the causes productive of illuminating power, obtained by means of incandescent gas, as well as the experiments upon which they are founded. Summarize previous theories.

(2.) *Secondary Standards.*—Give the principal figures found to be the value of the different secondary standards as between one another; set out the methods of comparison used in each case. This investigation should include: The Carcel lamp, the Hefner lamp, the English 10-candle pentane lamp of Mr. Vernon Harcourt, the English pentane standard of 1-candle, the German Union paraffine candle, and the English spermaceti candle.

(3.) *Photometric Rules.*—Rules to be observed in measuring the lighting power of incandescent gas burners, independently of standards of light and photometers. These rules must be applicable to different types of burners; but, in order to be able to arrive at certain precise data, as a basis a burner may be taken consuming about 110 liters (3.885 cubic feet) at a pressure of 40 mm. (1.575 inches); this is, moreover, one of the most generally used burners. Among the rules to be laid down, we will mention those concerning the following points:

(*a*) Regularity in combustion of the burner without mantle, but provided with chimney; dimensions; form of test chimney.

(*b*) Regulation of the ejectors for the agreed upon volume of gas (110 liters, or 3.885 cubic feet) at the given pressure (40 mm., or 1.575 inches).

(*c*) Duration of the combustion of the mantle *before the first*, duration of combustion before every other test.

(*d*) In how many azimuths will the measure of the horizontal illuminating power be made? How many photometric points at least will be made in each azimuth? (Either before or after reversing of the photometer, in cases where the instruments allow of this being done.) Only the points which do not differ more than.... ...will be converged to the average.

(*e*) Indicate the calorific power and the number of candles or the standard of the gas used. (This information is, of course, subject to the results of examination into the fourth question.)

(*f*) Need of the adoption of an auxiliary standard in photometric work; measure its value in working with the usual secondary standard, at the beginning and at the end of the experiment; minimum agreement allowed between these two measurements.

(*Continued on page* 192.)

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NOTICE TO ADVERTISERS.

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NEW YORK, MONDAY, MARCH 18, 1912.

[Official Notice.]

Annual Meeting, Illinois Gas Association.

Illinois Gas Association,
Temporary Office of Secretary,
Dixon, Ills., March 6, 1912.

To the Members, Illinois Gas Association: The next annual meeting of the Illinois Gas Association will be held in the Auditorium Hotel, Chicago, under dates of March 20th and 21st, 1912. Papers on these subjects are being prepared:

"Coke Breeze."
"Up-to-date Gas Lighting."
"An Illinois Gas Man's Impressions Abroad."
"Two Pounds Pressure at the Tip. Why Not?"
"High Pressure Distribution."
"Liquid Purification."
"Photometer Work."
"Study of a Water Gas Machine."
"Commercial Paper."

Word has been received that the banquet in connection with the meeting will be held the evening of March 20, in the "Florentine Room" of the Congress Hotel. Mr. John Parker, Western Sales Manager of the Eclipse Stove Company, is to be our toastmaster. An excellent banquet has been arranged for and very able speakers, of local and national reputation, will be on hand. As to the vaudeville entertainment following the banquet, this matter has also received careful study, and from all assurances there will be no lack of excellent talent. It cannot be too strongly impressed upon the members that their attendance at this convention is of the utmost importance. The excellent papers listed cannot help but be of interest, and the authors should be rewarded by a good discussion of their presentations. Wherefore, lay all matters aside and plan to spend the 20th and 21st in Chicago, thus making of these two days ones long to be remembered.

F. E. Newberry, Secretary.

[Official Notice.]

Fourth Meeting of the Pennsylvania Gas Association.

Pennsylvania Gas Association,
Office of the Secretary,
West Chester, Pa., Feb. 21, 1912.

To the Members, Pennsylvania Gas Association—Gentlemen: The fourth meeting of the Pennsylvania Gas Association will be held in Williamsport, Pa., the 10th, 11th and 12th days of April. Indications are that it will prove successful and interesting, possibly more so han any other preceding one. Let us work to that end. Any communications addressed to the Secretary, care the Chester County Gas Company, of West Chester, Pa., will receive prompt attention.

Yours truly, W. O. Lamson, Jr., Secretary.

[Official Notice.]

Fourth Meeting, Southern Gas Association.

Office of the Secretary,
Southern Gas Association,
Atlanta, Ga., Feb. 19, 1912.

Gentlemen: The Fourth Annual Meeting of the Southern Gas Association will be held in Jacksonville, Fla., April 17, 18 and 19, 1912. The following papers are promised:

"Further Notes on Public Policy," by Mr. R. C. Congdon, Atlanta, Ga.
"Better Domestic Appliances," by Mr. C. A. Case, Cleveland, O.
"Scientific Salesmanship as Applied to the Gas Industry," by Mr. Albert B. Kelley, Philadelphia, Pa.
"Gas Lighting in the South," by Mr. H. P. Dains, Philadelphia, Pa.
"A Practical Demonstration," by Mrs. S. R. Dull, Atlanta, Ga.
"Practical Experiences in the Gas Business," by Mr. Roscoe Nettles, Tampa, Fla.
"The Influence of Various Departments on Commercial Work," by Mr. Chas. D. Armstrong, New Orleans, La.
"System in Office Management," by Mr. L. N. Young, Athens, Ga.
"A Study in Retort House Practice," by Mr. S. H. DeFreese, Chattanooga, Tenn.

Hotel and railroad rates will be announced later.

E. D. Brewer, Secretary.

BRIEFLY TOLD.

March Meeting, New York Section, Illuminating Engineering Society.—The March meeting of the New York Section, Illuminating Engineering Society, was held at 8:15, the evening of March 14th, in the Building of the Engineering Societies. The practice of having an informal dinner prior to the meeting was continued, and some 50-odd members and guests dined at Keene's Chop House, the diners being reinforced by as many more when the return to the meeting hall was made. Chairman Stickney having quickly dispatched the business portion of the meeting, with the aid of Secretary Marshall and Vice-President Macbeth, called upon Mr. M. F. Sawyer, of the Kinemacolor Company, who described the process by which colored motion pictures were taken and projected. Briefly, this consisted of photographic impressions taken in duplicate, being filtered by a red and green screen alternately. The effect of the red filtering and the green filtering is combined to appear as a single impression by means of increasing the speed of the films to 32 feet per second, 16 feet per second being the speed with ordinary black and white motion pictures. The process was then demonstrated by means of a number of many beautiful views, which pleased the audience very much, to judge from the applause. The serious side of the evening session was served by a well-known and able member of the Society, Dr. H. E. Ives, whose theme was the somewhat abstruse one of the "Relation between Photography and Photometry" in a clear and lucid manner. The paper carries considerable data for those who wish to pursue the subject, and also a description of a new method of obtaining a value in mean spherical candle power of light sources having a rapidly changing flux, such as the flaming arc, by means of photography. The paper was discussed by Messrs. Norman Macbeth, J. C. Shaw and Dr. H. H. Seabrook.

CURRENT MENTION—

Mr. T. M. Ambler has been appointed Manager of the Commercial Department, Brooklyn Union Gas Company, and assumed direction thereof the 1st prox. His headquarters will be in the Citizens branch, 130 Atlantic avenue. Mr. Ambler's first connection with the artificial lighting business was with the Missouri Electric Light and Power Company, 1890; was with the Laclede Gas Company, of St. Louis, Mo., from 1893 to 1905; and was with the Welsbach Company in the period between 1905 and 1910. He has been virtually out of business since 1910, and his respite served him to such good stead that he is physically and mentally equipped to take firm hold of putting the commercial division of the Brooklyn Union Company on its proper basis.

At the annual meeting of the Guild of Gas Managers (Young's Hotel, Boston, noon of the 9th inst.) the following officers were re-elected: President, W. G. Africa, Manchester, N. H.; Vice-President, Benjamin J. Allen, Boston; Treasurer, John A. Coffin, Gloucester; Secretary, H. K. Morrison, Brockton.

MR. A. W. AUSTIN has been elected President of the Consumers Gas Company, Toronto, vice the late Mr. John L. Blaikie; and Mr. Wellington Francis, K. C., succeeds Mr. Austin in the Vice-President's place.

MR. W. C. WOOD and associates, whose purchase of the gas division of the plants of the Roanoke (Va.) Gas and Water Company, was recently noted in the JOURNAL, have, through comparing advices and suggestions with Mr. W. A. Allison, acting as Consulting Engineer, have determined on plans for bettering the plant. Mr. G. H. Horning has been appointed General Manager of the Company.

MR. HENRY E. PLUMMER, formerly Resident Manager of the Lisbon Falls (Me.) Gas and Electric Company, is no longer connected with that enterprise. The properties thereof (they are mainly of the electric order) were recently sold to Mr. N. Fletcher Curtis and associates, of Boston, Mass.

IT seems a settled fact that the proposed gas works for Port Arthur, Tex., will be constructed by Mr. J. S. Connell, of Carthage, Mo. In any event it was the Connell proposition that was favorably considered by the Port Arthur Council. The grant is for 21 years, only, and a maximum rate of $1.50 per 1,000 cubic feet may be charged.

THE annual meeting of the Providence (R. I.) Gas Company was held, the 4th inst., in its main offices, 20 Market Square, and over 78 per cent. of the shareholding was represented. The annual report of the Directors (it was a comprehensive and well digested statement) showed that the output for the year was 1,431,766,000 cubic feet, as against 1,338,890,000 cubic feet in 1910—a gain of 92,776,000 cubic feet. The gain, while not so large as those relatively reported for the two previous years (that is, from a percentage standpoint) is likely equal to the ratio of those when proper noting is given to the remarkably bright average days of October and November last. The residuals returns showed those sales: Coke, 12,842 tons; coal tar, 730,099 gallons; ammoniacal liquor, 309,649 pounds. The distribution system was increased by the placing of 10.7 miles of pipe of all diameters; new services, came out at 1,300, and 772 services were relaid. The meter account shows: In use January 1, 1912, 47,649; meters set, 19,745; meters removed, 17,321; net increase for the twelvemonth, 2,424. The main system changes were notable in that these included an 18 inch pipe from Sassafras Point to the southern section of the city, and to the northerly section of Cranston, thus equalizing the supplying conditions. The new coal gas plant at Sassafras Point (which our readers will remember is of the Didier-March type, and which was constructed under the practical guidance of Mr. Fred. Mayer) has given complete satisfaction. The present example consists of 3 stacks of 60 verticals, and the make is now so close to the maximum, that the construction of the 4th bench is likely close at hand. The main preliminaries in connection with the construction of an office building, on the plot 85 to 89 Westminster street, acquired by the Company some time ago, are unchanged. Every subscription receipt for the issue of $1,400,000 additional stock has been cancelled and certificates for their holdings issued to shareholders of record. The capital now amounts to $4,900,000, and steps to largely increase this are soon to be taken. All of which would seem to show that the Company made no mistake when President Ellis secured the services of Mr. Carroll Miller to direct its engineering propositions.

THE stockholders, having by hearty vote, thanked their representatives for their successful administration of the Company's affairs in the twelvemonth, set their certain seal of approval by re-electing the following Board of Directors: Jno. W. Ellis, Henry D. Sharpe, Frank W. Matteson, Newton D. Arnold, W. L. Hodgman, Isaac C. Bates, C. P. Brown, Jno. R. Freeman and Webster Knight. These in turn organized the Board thus: President and Manager, Jno. W. Ellis; Vice-President, H. D. Sharpe; Treasurer, Chas. H. Manchester (who succeeds the late Mr. Wm. P. Nye); Secretary and Assistant Treasurer, Arthur F. Short.

THE Boston (Mass.) Consolidated Gas Company is proposing to maintain an additional appliance store in the premises 11 to 29 Roxbury street, directly opposite the Dudley street Elevated Railway Station, and close to the Roxbury Institution for Savings. Gas bills may also be paid at the point named—in fact it will serve as a branch office for the convenience of the Company's many customers in the Roxbury district.

ON the 7th inst. there was introduced a resolution in the lower branch of the Rhode Island Legislature, an act proposing to increase the capital stock of the Providence Gas Company. Mr. Edwards, of counsel for the Company, in explaining the act said it provided for an amendment to the Company's charter authorizing it to increase its capital stock 100 per cent., or from 5 to 10 millions of dollars. The present capitalization of 5 millions is all issued save $100,000, but as large sums are needed from time to time for extensions and improvements, it was thought good financial business to be ready for such demands. None of the stock may be issued unlees the same be offered for sale at par.

MANAGER W. M. HENDERSON, of the Fresno divisi on of the Pacific Gas and Electric Company, is directing the construction of a new concrete storage structure (29 feet by 60 feet) on G, between Fresno and Mariposa streets. He is also preparing plans for new housing for additional water gas plant. No change, however, will be made in the Company's present office housing on J street, which earlier in the year it was thought would be reconstructed.

AT the reorganization meeting of the shareholders in the Washington (Pa.) Gas Company, the officers elected were: Directors, D. V. Wyckoff, Oscar Jeffrey, F. N. Jenkins, E. P. McKinney, S. P. Bowers, W. O. Cowell, H. Stelle, H. E. Wodman, P. M. Sterthwaite, H. D. Pfeffer and E. Simpson; President, D. V. Wyckoff; Vice-President, F. N. Jenkins; Treasurer, H. W. Ridgway; Assistant Treasurer and Secretary, Henry Stelle.

BOOK REVIEWS.

Outlines of Applied Optics, by P. G. Nutting. The broad subjects included by the author of light, illumination, the eye and photometry, are given in a condensed volume of 235 pages with 73 illustration. Published by P. Blakiston's Son & Co., Philadelphia. Price, $2. The author, who is an associate physicist of the Bureau of Standards, states in his preface that applied optics is practically untaught in any university; and, further, that no other class of engineering offers higher prizes than the different branches of optical engineering-lens design, illuminating engineering, calorimetry, photometry, radiometry, pyrometry, etc. While the author's prediction may not be literally true, the field is certainly not overworked in any one of these branches. The author's concise directness of expression has enabled him to cover intelligently a broad field. No attempt is made to make the book explanatory, for a general education along the the lines of the book is taken for granted. The references are profuse and of high quality. In another column an appeal is made by Mr. C. O. Bond for more active investigations and work in photometry, and those who are stirred by his words will find this work of considerable value.

British Institution of Gas Engineers, "Transactions, 1911."—The annual "Transactions" of the British Institution of Gas Engineers, whose years of activity (counting its predecessors) number 49, come in a modest volume of less than 500 pages. The papers and discussions at the notable 1911 convention, and also a number of valuable abstracts are included. The volume of matter reaches considerable proportions, and its compactness, as well as the selection of paper, type, arrangement of cuts, etc., set a standard which American societies could investigate with profit.

Publications.

[All Publications, Catalogues, etc., mentioned below, are kept in our office for the convenience of our patrons.]

Gas Abstracts.—The February number of the "Abstracts of Gas and Electric Literature," published bi-monthly by the American Gas Institute, is ready for distribution. These can be obtained through the Secretary, Mr. George G. Ramsdell.

The Electric Vehicle.—The business getting value of small, interesting publications, for distribution among consumers, seems to be of some importance, to judge from the number which are being issued. The "Electric Vehicle," published monthly by the Denver Gas and Electric Light Company, is one of the newer of these "house organs," and the readable descriptive matter is beautifully set forth by handsome color and presswork.

Gas Institute News.—The second number of the monthly publication of the American Gas Institute, "Gas Institute News," indicates that it will prove a useful medium of keeping up the interest in Institute affairs, and will also be a means of keeping the meetings free from much routine matters, such as wrinkles, etc.

Lux et Veritas.—Under this title, a handsome volume describing the relation between illuminating engineering and modern glassware of the diffusing type has been issued by the Opalux Company. The work might be called a handbook, and in many respects will undoubtedly be used as such. The references are well selected and full credit is given for the sources of information. The student, as well as the practitioner, will find much of value for reference and perhaps inspiration.

(*Continued from p.* 189.)

(*g*) Measurements of the variation in the lighting power with the duration of the lighting of the mantle. It will follow from the comparison of the lighting power taken, for example, at the hours of zero, 10.....300.

(*h*) Comparison of mantles of the same kind, but from different manufacturers; for this, account will have to be taken of the results found on examination of the fifth question.

It is requested that other points that it may be thought useful to have settled. as well as propositions to be made in this connection, will be notified.

(4.) *Calorific Power of Coal Gas.*—Experimental researches as to the influence of the calorific power of coal gas on the lighting power of incandescent burners. Deduce, if needs be, from the preceding experiments, the solution of the following question:

When the lighting power of a burner supplied with gas of a known calorific power has been ascertained, how, by calculation, can the lighting power be found which this burner would give a gas of different calorific power, taken as of normal power.

This correction would have for its object making photometric results, obtained with gas of varying calorific power, comparable as between themselves.

(5.) *Standard Type of Burner.*—Experimental researches, with a view to obtain a burner fulfilling the necessary conditions to constitute a standard type of burner to allow comparisons between mantles of different origins, but of the same kind; corresponding, for example, to an hourly consumption of about 110 liters (3.885 cubic feet) at a pressure of 40 mm. (1.575 inches).

Standard types of burners for higher and lower consumptions.

(6.) *Mantles.*—(*a*) Different elements forming the mantle; their influence on the quality of the mantle. This working aims at various subjects which can be treated as distinct investigations as regards, for example, the nature of the material forming the mantle, its microscopic examination, the deformation or shrinking of the mantle, resistance to mechanical strains, the causes in the variation in the lighting power with the duration of the lighting, the strengthening of certain parts; and, in general, the different modifications which have been recently noticed or introduced in the manufacture, on account of their beneficial effect on the durability, lighting effect, or any other quality of the mantle.

Some of the characteristics of the mantles, covered or not by paragraph (*a*), are capable of being measured, and some of them would act as a check on certain qualities of the mantle, either in the course of its manufacture, or on its delivery; it is to make allowance for this point of view that we add the following question:

(*b*) Different tests applicable to mantles, with the object of ascertaining their properties independently of the photometric point of view; methods of measurement; stamping apparatus.

(7.) *Standardization of Screw Threads.*—Standardization of screw threads of different types of fittings placed in consumers' houses for the distribution and use of gas.

First Session.

The British Report of the Transactions and minutes of this first session, as prepared under the authority of the Council of the Institution of Gas Engineers, filled 71 pages of their "Transactions." Twenty-two pages were devoted to the minutes and 42 pages to the 6 communications, as follows:

Dr. H. Bunte, Karlsruhe: "Technical Standards of Light."

E. Sainte-Claire Deville, Paris: "Variations in the Lighting Power in the Incandescent Burner of Combustible Gases."

Charles Carpenter, London: "An Improved Photometer for Testing the Values of Ordinary and High Power Burners."

M. Bohm, Turin: "A Method of Determiuing the Luminous Intensity of Incandescent Burners."

Th. Vautier, Lyons: "Measuring the Toughness of Incandescent Gas Mantles."

M. J. Payet, "Note on the Standardization of Screw-Threads for Apparatus for Gas Consumption."

The recommendations resulting from the very interesting first session of this Committee may be summed up as follows:

1. That in photometric tests on incandescent gas burners the calorific power of the gas be ascertained at the same time as its lighting power, and that the gas should be described; as for instance, coal gas, water gas (carburetted or not), or mixed gas, with the proportions of each in the mixture; and, if water gas, what type of apparatus produced it.

2. When publishing the results of measurements experimentors are requested to give the calorific power in calories (kilogramme-degree) per cubic meter of gas at constant pressure, water as steam at zero degrees Centigrade and 76 centimeters of mercury and to indicate the calorimeter used.

The Committee takes note of, and thanks M. Deville for his research as to the relation between lighting power by incandescence and calorific power of combustible gases, and requested a continuation of this research by experimentors in other countries.

3. The Committee recommended the provisional adoption of the relation between light standards given in Dr. Bunte's Table No. 2, which was (using the English candle as a unit):

English candle = 1
German candle = 1.05
Hefner = 0.877
Harcourt wick lamp = 1.03
Harcourt 10-candle lamp = 10.00
Carcel lamp = 9.53

Further work was outlined as follows:

To continue the research as to the relationship between calorific power and incandescent lighting power of combustible gases; to urge upon delegates from different countries to furnish descriptions of the methods used in their respective countries for the practical photometry of incandescent gas burners; the continuation of the investigations of methods for comparing lights of different colors; the authorizing of separate tests in Germany, England and France as to the relative values of the standards of lights in these countries; and the authorizing of a subcommittee to deal with the standardization of screw threads.

Second Session.

The second session was held at Zurich in July, 1907. The English report of this session filled 110 pages, illustrated. There were 15 pages of minutes (95 pages containing 16 communications) as follows:

James W. Helps, Croydon: "Methods for Measuring the Light of Incandescent Burners in England."

Dr. Kruss, Hamburg: "Methods for Measuring the Light of Incandescent Burners in Germany."

Herr van Rossum du Chattel, Amsterdam: "Methods for Measuring the Light of Incandescent Burners in Holland."

M. Lauriol, Paris: "Photometry of Different Colored Lights."

M. E. Sainte-Claire Deville, Paris:

First Memorandum: "The Illuminating Power of Coal Gas in Different Countries."

Second Memorandum: "The Illuminating Power in Incandescent Burners of Coal Gas Compared with that of Water Gas and of Mixtures of the Two."

Third Memorandum: "The Illuminating Power in Ordinary and Incandescent Burners of Coal Gas, Water Gas and Mixtures of these Two Gases, both with and without Enrichment by Benzol."

Fourth Memorandum: "On the Proportion of Air for Combustion in Vivid Incandescence."

Charles Carpenter, London: "Standard Test Burner for London Gas."

"Molten Platinum as a Unit of Light."

"Unification Screw Threads."

Comparisons of Light Standards.—Dr. Emil Liebenthal, Berlin: "Investigations by the Physical Imperial Institute at Charlottenburg."

C. C. Patterson, England: "Report made by the National Physical Laboratory to the Institution of Gas Engineers."

M. Perot and M. Janet, Paris: "Report on the Researches Carried Out at the Testing Laboratory of the National Academy of Arts and Trades and at the Central Electricity Laboratory of Paris."

M. Laporte, Paris: "Supplementary Investigation of the Relation between Standard Flame Lamps: Carcel, Hefner, Vernon Harcourt."

M. Laporte, Paris: "Examination of Results Obtained for Ratios between Three Standards: Carcel, Hefner and Vernon Harcourt."

Four resolutions were passed by the Committee at this meeting, the first expressing the wish that research should be continued in the interest of photometry on the fusing point of platinum; the second one again thanked M. Deville for his important communication, and requested further research in the different countries on the relation between the maximum illuminating power and calorific power of the gas; the third the adoption of a suggestion of Prof. Drehschmidt of symbols for illuminating power, as follows:

I^h = Horizontal illuminating power.

$I\alpha^s$ = Illuminating power at an angle α to the horizontal above the horizontal.

$I\alpha^i$ = Illuminating power at an angle α to the horizontal below the horizontal.

I^o = Mean spherical illuminating power.

$I\,\supset$ = Mean upper hemispherical illuminating power.

$I\,\subset$ = Mean lower hemispherical illuminating power.

$I_m a s$ = Maximum illuminating power in the upper (s) or

$I_m a i$ = (lower (i) hemisphere, that maximum occurring

$I_m a_i$ = (at the angle a.

and, fourth, again directing attention to utility of determining of illuminating powers of ordinary self-luminous flame burners and incandescent burners, both upturned and inverted, and to the establishment for the latter of the most satisfactory method of determining the M. H S. and M. S. intensity, and these results be communicated to the Committee.

Third Session.

The official report of the third session of the International Photometric Committee (Zurich, from July 26th to 29th, 1911, inclusive) has not yet been made, but from the rather full extracts and comments which appear in the *Journal of Gas Lighting*, the following information is available:

That the Committee has adopted the following relations between three light standards: Vernon Harcourt lamp = 1.035 Carcel = 11.10 Hefner.

The Photometric Committee takes note of the agreement concluded between the three National Laboratories of England, France and America, as to the maintenance of a common illuminating unit, but they consider that it would be better not to give the name "International" to a unit which has not yet been accepted by certain important countries. The questions of internal administration discussed are of peculiar importance to this Institute which has the appointing of American delegates.

It seems that the Committee has been hampered in its work by: (1) An insufficient number of members; (2), by lack of early or definite appointment of representatives from the different technical societies; and (3), by the absence of any scheme for meeting the financial needs of the Committee.

A fourth question for action was on the admission of representatives from the electrical interests, application for which had been made by the Association of German Electricians.

As a result of the action taken America will now be entitled to 3 delegates, having together one vote, and it is recommended that the appointments or reappointments be made as early after each Committee session as possible, in order that organization and the delegating of research work may be effected.

The question of finance was carried over to the next session, which practically means that the next delegates attending should have received instructions from their appointing societies in this matter before the session.

The following resolutions were carried:

"The International Photometric Committee are of the opinion that, for questions common to both gas and electrical industries, the electricians be invited to participate in the meetings."

The Bureau of the International Photometric Committee to invite the National Electro-Technical Committee of the International Commission of Electricians to delegate 2 electricians for each country having 6 delegates and 1 for each country having 3 delegates to take part in the discussion on all questions of common interest. It was further decided that, in all matters before the Committee where its imprimatur was desired, four-fifths of the votes expressed were necessary to carry it. The Committee expressed its opinion as favorable to the calorific rather than the photometric test of the quality of gas. (See discussion in body of paper.) Other subjects presented at the Third Session were:

Dr. Eitner, Karlsruhe: "Methods of Photometry in Use in Germany."

Messrs. Butterfield, Haldane and Trotter: "Corrections for the Effect of Atmospheric Conditions on Photometric Flame Standards."

"Photometric Dimensions and Units," a subject presented for consideration by the Illuminating Engineering Society.

Dr. Hugo Strache, Vienna: "Flame Temperature and Incandescent Lighting Power."

M. Thovert, France: "A Technical Spectral Photometer."

The foregoing brief summary is sufficient to show the character, both of contributions and authors and, I think, to warrant the motion which has been presented in the body of the paper.

APPENDIX II.

As concerning the substitution of the calorific for the photometric test a letter containing the following questions, and requesting a brief statement in reply to them, was sent to the Secretaries of the Gas Associations in England, France, Germany, Holland and Italy:

(1) When the change began?

(2) Whether any cases exist in which the same gas is legally subject to both tests?

(3) If the two methods of test are legalized, in what class of cities is the calorific test prescribed and in what class is the photometric test?

(4) In general, who have requested the change to calorific test? (a) The consumers; (b) The legislative bodies in response to scientific counsel, or (c) The gas companies?

(5) What is the argument usually advanced for the change?

(6) What is considerad a fair calorific requirement for manufactured illuminating gas and is this net or gross?

Replies were received from Germany, England and Italy as follows:

From Germany.—"In the absence of General Secretary, Dr. K. Bunte, I have taken cognizance of the contents of your worthy letter of July 12th, and am sending for your information concerning the matter under consideration in Germany, a reprint of a report which I formerly made in Frankfort. You will see by this that, in Germany, where the majority of gas installations are owned by cities, especially in the larger cities, such as Berlin, Munich, Cologne, Breslau, Frankfort, Dusseldorf, Hamburg, Nuremburg, etc., almost without exception the calorimetric examination is made; and only rarely, unless there is a special contract, is the photometric test used. Therefore, here in Germany we may safely state that the calorimetric test is universally applied where any inspection is provided for, unless it be that prior contracts require the photometric test.

The other contents of your letter will be noted later.

Respectfully, H. Bunte.

The report mentioned by Dr. Bunte in the *Journal für Gasbeleuchtung*, Sept. 18, 1909, and an English translation appeared shortly afterward in the *Journal of Gas Lighting*.

From England.—"In reference to your inquiries of the 13th inst., addressed to our Mr. Dunn, the Secretary of the Institution of Gas Engineers, I beg to reply as under, viz:

(1) The change cannot be said to have generally commenced in this country as yet.

(2) Yes! In the cases of the Gas Light and Coke Co., The South Metropolitan Gas Co., and the Commercial Gas Co., all of London; under the provisions of the London Gas Act, 1905, and the Gas Light and Coke Co.'s Act, 1909.

(3) The two methods are only legalized in London, as answer to Question 2; all others have a photometric test only prescribed.

In the case of London, the Gas Light & Coke Co., is the only Company working under penal clauses with respect to calorific tests. In the cases of the other two companies, although calorific tests are equally compulsory with photometric tests, calorific deficiency is *not penalized*, but photometric dificiency is liable to forfeiture specified in the Act.

(4) (*a*) No; (*b*) Yes; (*c*) No, as the gas companies of this country are quite content to work under the photometric test, with a standard (generally) of about 14 candle power, at 5 cubic feet per hour, at tested with the No. 2 Metropolitan burner, which is rapidly displacing other standards.

(5) As there is as yet no great desire for the change, no leading line of argument for it has been adopted, but the main argument used for reduction in illuminating power standard is economy in production, accompanied by very slight calorific value, resulting in a cheaper and more efficient service to the consumer; the illuminating power of the gas *per se* being now of little consequence.

(6) The concensus of opinion would appear to be forming round about 125 calories net per cubic foot. In The Gas Light & Coke Co.'s Act (1909). 125 calories, net, is adopted as the standard, but they do not incur liability for penalties unless it should fall below 112½ calories, net. The following is the scale of penalties imposed for deficiencies proved below 112½ calories net, viz:

Deficiency not exceeding 3 calories net, maximum penalty £5.

Deficiency exceeding 3 calories, not amounting to 6 calories, net, maximum penalty £10.

For each complete 6 calories further deficiency, penalty not less than £25, nor more than £100.

Further not more than any one authority can recover forfeiture for any one attempt.

As showing the present transitory state of calorific standard, is is further provided, in The Gas Light & Coke Act (1909), that the calorific standard may be modified, as may also the margins of deficiency and penalty, at the end of the first 3, or any 3 successive years, should it be found desirable by either the local or municipal authorities, or the gas company.

Trusting the foregoing may meet your requirements and with kindest regards, I am, Yours faithfully, R. G. Shadbolt, President, Institution Gas Engineers.

From Italy—In conformity with the promise contained in my letter to you of August 24, 1911, beg to advise that I have communicated through our Association with all the leading cities of Italy (on the subject of the change from the photometric to the calorific test). As a result of these inquiries, I find that, with the exception to Milan (600,000 inhabitants) and Modena (60,000 inhabitants), none of these leading cities have undertaken the calorific test, but all of them still make use of the photometric test, only based on the Paris method, which is 105 liters per carcel hour.

In Milan the calorific test was imposed by the municipality (December, 1901), in addition to the photometric test, and the prescribed quality is 5,100 (net) calories per cubic meter, with an allowable variation of 300.

In Modena the calorific power test was imposed in 1896, specifying 3,350 calories per cubic meter (this by contract), and this in addition to the illuminating power requirement of 105 liters per carcel hour.

I can give you no further authoritative information, other than that in the several cities where the manufactnre of gas under municipal control, there is prescribed neither illuminating power nor calorific power.

Hoping to receive a copy of your paper, as well as a report of the "Proceedings" at the St. Louis Conventinn, I am, with best regards, Sig. L. G. Maggioni.

The President regretted he could not invite discussion on Mr. Bond's scholarly paper, but he had been thanked by their applause. Remember, the Chair did not write the programme, and was only doing his level best to carry it out.

(To be Continued.)

The General Gas Light Company, announces that, beginning the 1st inst., it will distribute its goods to the Pacific Coast trade through its new offices and warerooms, 237 Powell street, San Francisco. The Company asks that all orders, in fact, all business communications emanating from or in the Pacific Coast District, be sent to it there. The office is under the care of Mr. A. B. Babcock.

[Continued from Page 180.]

PROCEEDINGS, FOURTH ANNUAL MEETING, INDIANA GAS ASSOCIATION.

Held in the Claypool Hotel, Indianapolis, Ind., January 17 and 18, 1912.

Second Day—Afternoon Session.

The President called for the

Report of the Nominating Committee,

which was read by Mr. H. L. Riley, as follows:

Gentlemen—The Nominating Committee places in nomination the following members of the Association:

For President—Mr. Howard L. Olds.
For Vice President—Mr. William Wallace.
For Secretary-Treasurer—Mr. Philmer Eves.
For Directors—Messrs. Carl H. Graf, A. C. Blinn, G. M. Dolley, 3 years; A. S. Cooke, 2 years; D. A. Barnes, 1 year.

William Wallace,
J. H. Maxon,
H. S. Riley,
J. H. Dykeman,
J. C. Vance,
} Committee.

On motion of Mr. Dykeman [seconded] the report was adopted, and the Chairman directed the Secretary to cast the ballot in favor of the election of the gentlemen named. The Secretary subsequently reported that the ballots had been cast, and the Chairman declared the result in accordance therewith.

Some Responses.

The President said he took occasion now to thank the members for the honor conferred upon him in electing him President of the Association during the past year. At the time he was elected (last year at Fort Wayne) he said he wished he could feel enthusiastic over it, but realized there was some hard work ahead. The work was hard in a way, but it had been made extremely pleasant by reason of the fact that he had had the co-operation and enthusiastic support of the members of the Executive Board, and realizing that, as he did, was one of the main reasons which he urged the Nominating Committee to retain, for the present year at least, the present Board of Directors. Their experience was going to be very valuable to their new President, just as it had been to him. He wished to thank personally every member of the Association, and of the Executive Committee especially, for what they had done, and to express further his personal appreciation to those who took the time and made the effort to furnish the papers that have made this meeting, as they all would concede, at least a reasonably fair success, While they had not as yet expressed any formal vote of thanks to those who supplied the papers, such was arranged for by a resolution that would follow later. He then, though, had the honor and the pleasure of introducing to them their President for the present year, Mr. H. L. Olds. [Great applause.]

Mr. Olds said, Mr. President, ladies and gentlemen: It certainly is a very great honor that you have bestowed upon me, and I assure you I appreciate it. Your Association is the best State Association in the country, and you are doing lots of good work. Stop to think for a moment. The State of Indiana is again coming into a real artificial gas business, and the Association has an opportunity to assist in this development. I do not know that I have ever seen any statistics on the per capita sales in towns that are selling artificial gas in this State, but I believe I would be right in saying they are below other States. Now, it is up to you to assist this Association in the work of developing this State. I don't believe any other State has passed through just what Indiana has. Several years ago it was an artificial gas State, then it turned to a natural gas condition; and natural gas is now going out of style, so we are all glad to see artificial gas come in. During that period many of the people were educated in the use of gas, and I don't believe you are going to find it quite as hard to reach the high point in the per capita sales that we desire to as it was several years ago. I know I am voicing the sentiment of those connected with the Association in the next year's work when I say that we want your help, your best thought, and any suggestions that you have to offer, because we want to be all that we feel we can be. Thank you, gentlemen, for this honor. [Applause.]

The President said he would voice a few words in reference to the Vice-President elect. Mr. Wallace could probably be called the Dean of the Gas Profession in Indiana, for he was one of the signers of the original charter of the old Western Gas Association. He felt that in conveying this compliment to Mr. Wallace the Association was honored by doing it. He directed the speaker, however, to state that under no circumstance or condition would he permit his name to be used for the Presidency of this Association; and that at the expiration of the term as Vice-President he would step back to the ranks.

The President called for the

Report of Committee on Place of Meeting,

which was made by Mr. A. C. Blinn, who reported that the Committee had decided to recommend Indianapolis as the place. [The report was indorsed.]

Applicants for Membership.

The Secretary, having been requested to report regarding the applicants for membership, prior to giving these said that he wished to return thanks to the Indiana Gas Association for electing him the fourth time as Secretary-Treasurer. It was a great pleasure for him to work in the interests of the Association, and he was certainly proud of the honor conferred upon him again that day. He then read the following list of names:

Active.

Bell, I. J., Bedford.
Campbell, Roy Elwood.
Chubb, C. N., Michigan City.
Clifford, W. H., Marion.
Dawes, R. C., Chicago, Ills.
Dresser, G. W., Warsaw.
Elder, T. A., Jr., Shelbyville.
Flynn, F. R., Elkhart.
Hanna, C. B., Aurora.
Markley, J. C., Chicago.
Martin, J. G. Greencastle.
Quinn, W. C., Aurora.
Ream J., Indianapolis.
Tracy, F. B., Muncie.
Wharton, J. B., Richmond.

Associate.

Barrett, A. T., La Porte.
Best, F. W., Utica, N. Y.
Birbeck, W. D., Fort Wayne.
Clark, J. C., Chicago, Ills.
Harbison, C., Mercer, Pa.
Hutchins, F. E., Chicago, Ills.
Klein, H. C., Rockford, Ills.
Little, N. T., Louisville, Ky.
Miller, C, C., Fort Wayne.
Strause, L. J., Philadelphia, Pa.
Tremain, L. E., Kalamazoo, Mich.
Wandless, G. D., Detroit, Mich.

Election of New Members.

The President—Those members, by the way, have come in without any unusual or extra effort of solicitation, indicating that the Indiana Gas Association has commenced to be looked upon as an institution it is well to hunt up and get into without being solicited.

A motion is in order for the Secretary to cast the ballot for the election of these members.

On motion of Mr. Cram the Secretary was ordered to cast a ballot electing the applicants to membership. [He subsequently reported that the ballot had been cast.]

A Resolution of Thanks.

Mr. Olds moved that a suitable resolution be prepared by the Secretary, and sent to all those who had written papers or in any other way were instrumental in giving pleasure to them at this meeting, a vote of thanks for all that had been done. [Seconded and adopted.]

The President owing to the absence of the author, asked the Secretary to read the paper prepared and forwarded by Mr. William Wallace, entitled

REMINISCENCES IN THE GAS BUSINESS.

Mr. President and Members of the Indiana Gas Association: I fear our worthy President made a mistake when he asked me to tell you of some of my experiences in the gas business. My becoming interested in the gas business was accidental as I had served a 5-year apprenticeship, and worked as a journeyman for several years at the plumbing trade in Cincinnati. Wishing to establish a business of my own, I visited Terre Haute and Lafayette, making Lafayette my choice as a location. In 1867, about 2 years after my arrival, the gas company began some improvements which seemed to be very much needed.

The plant had been built by Parish, of Philadelphia, and gas turned on in the town in 1852. The works had been in operation about 15 years, and had at least the appearance of being very much run down. It consisted of the usual retort and purifier houses with 4 benches of 3's, cast iron retorts; small round, cast iron hydraulic main; 4-inch stand and bridge pipes; 6-inch horizontal condenser laid in the ground with return bends; 4 wrought iron round purifiers, 5 feet in diameter, with wet center seal; a 45 foot holder contained in brick tank, held in position by a wooden mast in the center, which was guyed at the top to posts distributed about the yard.

While the output was small, averaging from 20,000 to 30,000 feet in 24 hours, the Company decided to enlarge the works, which they did by entering into a contract with Murray and Banigan, of Ft. Wayne (now the Kerr-Murray Company) who had but recently taken up this line of work. The contract with this firm was for 2 benches of 5's, clay retorts (the use of fireclay retorts had but lately been introduced into this country); a 60-foot holder, with brick tank; column washer; a multi-tubular condenser and 2 purifiers 7 by 10, with dry center seal. As this was the first holder undertaken by the Ft. Wayne Company, they sub-contracted it to a boiler maker who was not properly equipped for the work. The sheets were laid out and punched, one hole at a time, and in putting the sheets together the drift pin was incessantly used. When the holder was filled a great many leaks were found, and when completed, it did not compare in finish and good workmanship to the product of the Kerr-Murray Company of to-day.

I was employed by the Company to make necessary connections at the works. About the time the new plant was completed, a new President was elected, who offered me the position of superintendent, which I accepted, conditioned that it would not be necessary for me to give up the plumbing business in which I was then engaged.

My duties began in March, 1868. While I had but little experience in operating a gas plant, I could see that it did not require a great deal of knowledge or skill to make an improvement over the former management. From an old memoranda, I find that one of the first things we did was to sell off all old junk and scrap which was littered around. I then proceeded to solicit new business and make extensions.

Then, as now, coal entered largely into the cost of making gas. Pittsburgh coal cost 16 cents per bushel, on cars at Cincinnati, freight

and hauling 10 cents per bushel, or $7 per ton. In purchasing coal from dealers in Cincinnati we did not at all times secure a uniformly good quality. We went to considerable trouble to test coal from a number of mines in Ohio and Indiana, but failed to find anything to take the place of Pittsburgh coal.

I went to Pittsburgh in April, 1 year after I took charge, to endeavor, if possible, to secure the best grade of Youghiogheny coal, all rail, but the freight rate was prohibitive. However, I received information that trip that enabled us for years thereafter to secure the best grade of coal by way of the river. Was obliged at that time to gather information as best I could, having but slight acquaintance with gas men, this being about 10 years previous to the organization of the Western Gas Association. Being anxious to secure reliable information regarding the manufacture and distribution of coal gas, I purchased Clegg's books and made a careful study of them. While, of course, there have been many improvements in apparatus and methods of operation the same general principles have been followed.

After operating the new plant about a year, we arrived at the conclusion that 2 purifiers were not exactly right, as the gas passing through the 2 boxes fouled both. When the time came to change the lime, we could not reverse the flow and continue to use the old lime until it was exhausted. Having the old purifiers on hand, we set 1 box back in position so that the gas leaving the purifiers left a clean box, and did not waste the lime. This worked well until our consumption increased and made it necessary to add the 2 larger boxes, which was originally intended. I am still of the opinion that 3 boxes or more purifiers are best.

The next trouble was tar getting into the purifiers. The cause of this was the short run of pipe from the hydraulic main to the washer and condenser. We had no scrubber. I tried the experiment of twining a long, loose, rope of brushwood and suspending it in our column washer. The gas entering at the bottom, and the stream of water spraying the brush from the top, gave us very good results, until the sediment from the water and particles of tar adhered to the brush became almost a solid mass.

Our next experiment was to secure some 10-inch pipe and 2 or 3 elbows and cause the gas to traverse a greater distance, taking the gas off at the other end of the main, and passing it around the retort house wall before it entered the washer. This was quite an improvement. Later, we secured a boiler shell 4 feet in diameter, 14 feet long, and passed the gas up through this shell, filled with small boulders, which had same effect as the more modern scrubbers. We later substituted coke for the boulders.

Wishing to carry further the idea of continuing the flow of gas, tar and ammoniacal liquor together, and to cause them to come in contact with one another as much as possible, I made a square, cast iron box, 2 feet in diameter, and 12 feet long, set vertically, the gas entering at the bottom as passing up and discharged at the top. In this box plates were horizontally placed 3 inches apart. The tar and ammoniacal liquor, as they left the hydraulic main, entered near the top of this box and dripped on to the shelves, coming in contact with the gas as it passed upward.

After using this piece of apparatus 1 or 2 years, we introduced a rotary exhauster, utilizing the engine of the exhauster to operate a small rotary pump, and returned the liquor to the top of the box.

Desirous of reducing the cost of purification, and to do away with the use of lime, material was secured from St. John & Cartwright, who claimed it to be a patented process. The mixture, I believe, was somewhat similar to the oxide now used. After a few months' use, of this material, we had complaints of the burners clogging up, which we soon quieted by spreading burlap over the oxide and placing a tray of lime over it, but it was not long until it failed to revivify. It was then discontinued. At the time the works was built, or when it was rebuilt, no exhauster was used. With the clay retorts the carbon accumulation was quite heavy.

In 1877, 9 years after I took charge, a McKenzie jet exhauster was purchased, which reduced the pressure and also the deposit of carbon. However, here we found we were being troubled with stoppages from a deposit of naphthaline. I suspected it was from the use of the jet exhauster.

For the purpose of locating the trouble, we placed thermometers at different points, 1 on the outlet of the hydraulic main, 1 at a point before the gas entered the exhauster, and 1 immediately after; also at different other points. We kept this record for 8 months, and we found the average temperature of the gas from the main was 131°. After passing through the long line around the retort house, it was down to 100° or less, depending upon the atmospheric action upon the line of pipe. The change of temperature of the gas between entering and leaving the exhauster, increased 55° to 60°, and dropped again suddenly at the condenser to about the same temperature as it was at the inlet to the exhauster. We stopped using the jet exhauster and found some relief, but were at a loss to determine exactly whether the deposit was altogether due to the exhauster or to the increased temperature of our benches. Instead of being satisfied with a yield of 4 to 4½ feet, it had increased to about 5 feet per pound of coal. We used the jet 3 or 4 years, but finally abandoned its use and put in a rotary exhauster.

The street mains were usually of the smaller sizes of pipe. The one leaving the works, and extending to the center of the city, was a 6-inch line; the branches and extensions were generally made of 3-inch, but occasionally 2-inch pipe was used. This pipe was purchased in Philadelphia. The 3-inch and larger was in 9-foot lengths; the 2-inch was 6 feet long. All of the pipe at that time was moulded on its side, most of it being thin on one side and thick on the other.

As an experiment, in 1870, we bought 4,000 feet of 3-inch pipe in 12-foot lengths from the Gaylord Company, Covington, Ky. This firm cast pipe vertically, and used what was known as the Robbins-joint. Making the spigot end in a chill gave it a perfectly round and smooth end. In a recess in the hub end, a lead ring was cast. When the pipe was delivered on the street, the trench was properly graded, and necessary supporting blocks set. The pipe was then laid and pressed into place with a small hydraulic pump. A record of this line was kept and 11 years later, a thorough examination was made and not a leak was found. This line has now been down 42 years and seems perfectly tight. The Robbins-joint was easily and quickly made, but I do not believe that it ever came into general use.

In 1876, a new contract was made with the city and the price of gas reduced from $3.25 to $2.75 per 1,000 cubic feet. In 8 years the consumption had increased 100 per cent.

In the spring of 1878, Mr. Moyes, a traveling salesman, called, who presented a circular letter suggesting the organization of a Gas Association, which letter was signed by Mr. J. O. King, of Decatur, Ills., and 2 others. I was very glad to join in the call for a meeting for the purpose of organizing such an association. The first meeting was held in St. Louis, in September that year, and the body was called the Western Gas Association. I took a great interest in the meetings, as they furnished opportunities to exchange views with men in the same line of business. I have always felt that the manager of a small gas plant had responsibilities other than that of the manufacture and distribution of the gas. He should be careful in the protection of his company's interest.

Our city was visited by some men from the East, who assisted by one from Indianapolis, secured a franchise to build a works in Lafayette, claiming the patent process (the Lowe) which they owned could make and furnish gas at a much lower rate than we were doing. We investigated and found that these men could command the neccessary capital, but we also discovered the right to use the patent could be purchased. We, therefore, invested the necessary money to secure the right, but did not use the water gas apparatus for several years. Two or 3 years later another franchise was granted, but the company did not proceed with the work.

Agitation in regard to lighting the streets with electricity came before the City Council, who visited Cleveland and Akron. I was invited to accompany them. The Akron lights were erected on very high towers, 2 in number. This method was not satisfactory. In Cleveland, on Superior street, and some park lights placed 600 feet apart, gave a fairly satisfactory light. One year later, the Council awarded a contract to the Brush Company to place 5 arc lights on the tower of one of our public school buildings, which stood on a high elevation. It was claimed the lamps would light a radius of ½ mile, equal to a 4-foot burner at 100 feet distance. We secured the assistance of Mr. James Somerville, of Indianapolis, and made tests. We found the light fell far short of their claim. These lights were continued 2 years, taking the place of a few gas lamps, but the electric arc for street lighting had come to stay. The Brush Company succeeded in making a contract to light the streets with 201 arc lamps of 1,200-candle power, at a price of $50.60 per lamp. These arc lamps, when suspended over the intersections of the streets, made a good light and gave general satisfaction. We sustained quite a loss when the gas lamps were discontinued. The Electric Company now invaded the stores with arc light, and to meet this competition the Gas Company added an electric light plant, using a 2,000-candle power lamp. The people were getting an abundance of light at a cheap rate.

This resulted in a fight that lasted for 10 years, and which ultimately became a personal matter between some of the principal stockholders of both companies, but the opposition Company realized, when too late, that the price they received was not sufficient. They lost their stock and sustained quite a loss in their bonds. We purchased and moved their plant down to the gas works, and secured a contract at a higher rate. Our electric plant started with a 3-light dynamo. When the fight was over, we had 750-horse power of boilers, and 650-horse power of engines.

When the natural gas was brought into this city, it was the general opinion that the old Gas Company would be ruined, but our experience in the controversy over the electric light caused us to seek a different policy. The men at the head of the natural gas company were a different class of men. They had no wish to destroy property owned by their friends and neighbors. There seemed to be room for both. The old Company became a good customer of the natural gas company who did not press the sale of natural gas for lights, while the artificial gas company furnished both gas and electricity, and furnished the current for the street arc lights. The policy "Live and let live" was followed, which in this instance proved very satisfactory to both companies.

It is rather difficult to condense in a brief paper the experiences of 44 years, but I can assure you that the meetings of of the different gas associations have done a very great deal towards solving and overcoming many of the perplexities of the business. There are also reference books and papers dealing with the methods of making gas that were not to be had when the business was 44 years younger than it is to-day. I have of necessity omitted a great many incidents that might interest you as they certainly interested me at the time. I have, however, many pleasant memories of the business, and of the different men who served as directors during my time, all of whom have passed away.

The works as it appears to-day, with its new buildings, apparatus. holders, etc., and the many conveniences for handling material, give a very poor idea of the old place. I realize and appreciate, as you all do, the progress made in the gas business, and I feel that we have endeavored to keep pace with the times.

The President said this extremely interesting paper, was ready for discussion, but he feared not many present would admit his qualification by age to discuss this paper. We are rapidly getting to that age, just the same. [No discussion.]

MR. BIGELOW SPEAKS.

The President said before they closed he wished to say they had as a guest a gentleman who, during the past several years, had been extremely active in furthering and bettering the condition of the gas industry from the commercial standpoint. He knew they would all be pleased to hear a few words from Mr. L. S. Bigelow.

Mr. Bigelow—There is something in what Mr. Mulholland has said. I have to be exceedingly active in the gas enterprise of the United States, and some few things have come out of all that has been done. But the very thing that was said by your new President to you became necessary in order to accomplish what has been accomplished during these few years along commercial lines. In other words, there has been necessary co-operation, and that co-operation more recently has been forthcoming. I would say, for encouragement of those who have very great competition to meet, that during the first year or two of the effort to establish a national commercial gas association, there was a very great deal of opposition, but the more recent years have shown that the industry has discovered that a commercial movement is beneficial to both the commercial and the engineering sides of the industry. There are two ways of producing a very powerful incandescent gas light, one by forcing out the air and causing a vacuum, the other by drawing the air through to create the greater incandescence, and our effort in the National Commercial Gas Association has been the latter of the two. In other words, we have undertaken at the commercial end of the pipe to deliver the gas and have it used in such volume as to make necessary larger gas works and make necessary a higher type of engineering skill and make necessary the larger volume or the greater quantity of devices for the consumption of gas and of piping for the distribution of gas. A great commercial movement has been on for the last 5 or 6 years. It has been as directly beneficial to the engineering end of the industry as it has been to the commercial end. It was thought at first by some engineers that this was a move that would turn all attention to the commercial end of the industry. Instead of that, it directed attention to the works and to the engineer. He found it necessary to meet a new condition, that of a greater sale of his product. Thus the earlier idea has proved true, that a commercial movement means a developing of the entire industry, not a one-sided proposition at all. To-day, when listening to some of the discussions, I jotted down two or three things I had thought of using elsewhere; but I am going to use one of them here. The word "service"—service was spoken of this morning as a thing to sell as a thing to impress upon the public. There is another word similar "services" without rendering "service." Now, one may render "services" without rendering "service." An employee may render his services to the company, but in doing so he may not render real, true service. If we keep in mind that "service" is or should be the main object of the individual, the employee, and the company, and not simply the "services," then we shall serve our own interests as well as the interests of the public. I am exceedingly glad that so many of your members are members of the National Commercial Gas Association, and we hope very much indeed to see just as many of you as possible in Atlanta, Georgia, at the next convention of that Association. That does not interfere with the State Associations. State Associations are very, very important and the members thereof are very important to the National Association. [Applause.]

The President said the report of the Committee on President's Address recommended the approval or suggestion made by your President relative to the establishment of a Bureau of Information, the purpose of which was covered in the address. He appointed as chairman of a committee Mr. O. O. Thwing, who in turn would select the other members of the committee. The Secretary would later on mail a printed statement to the members as to the scope of this Bureau and what they could ask of it.

THANKS TO THE OFFICERS.

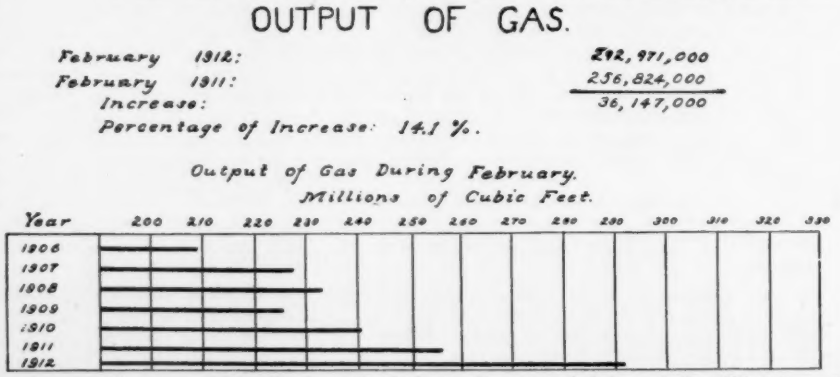
Mr. Graf said he felt they were about to close the most successful meeting that the Indiana Gas Association had held. It was encouraging because it showed they were progressing. The success of a meeting was usually due to the efforts of a few. In this case it was due to the hard work of your President, primarily, and to the able assistance of the Secretary. He therefore moved a rising vote of thanks to these two officers for what they had done. [Carried by rising vote, amidst vociferous applause.]

Final adjournment was then declared.

MR. A. A. CALDWELL, of Los Angeles, Cal., has secured a franchise under the terms of which he will construct and operate a gas works in Turlock, Cal. The estimated cost is $50,000, and he asserts that construction work will be completed by July 1st.

Management & Commercial Methods.

GRAPHIC SHOWING, GAS OUTPUT BY CONSOLIDATED GAS, ELECTRIC LIGHT AND POWER COMPANY, BALTIMORE.—We are indebted to the attention of Mr. Herbert K. Dodson, Commercial Agent, Gas Division of that well-managed corporation, the Consolidated Gas, Electric Light and Power Company, of Baltimore, Md., for the graphic showing of its gas output during the month of February in the successive years, beginning 1905. Even admitting that the last February was of the 29-day order, it will be noted that in February, 1908—the next having leap year period—the gain was 50 per cent. less than that shown in 1912. All of which goes to show that they are in error who charge that the business division of the Baltimore Consolidated lighting corporation favors the electric rather than the gas end.



THE AMERICAN METER COMPANY'S PREPAYMENT ATTACHMENT.—The new prepayment attachment for gas meters, which was put on the market some months ago by the American Meter Company, is gaining great favor for itself. This favor seems readily to be accounted for when it is known that the slot, for the coin, being on the front of the meter, is readily and easily accessible. Moreover, the indicator showing the quantity of unconsumed gas is positive and in plain sight. A common cause of annoyance connected with many prepayments is the frequent attempts of consumers to insert too many coins at one time. In the attachment under consideration this is rendered imposible, for when the exact or proper number of coins have been inserted the mechanism locks automatically, preventing the said mechanism from becoming jammed with the insertion of an excessive number of coins at one time. The two points about the attachment that serve as its best recommendations are:

First: Being made of drawn steel, it is as close to being burglar proof as it is possible to construct a device of such nature.

Second: The interchangeability of all the parts, it being perfectly practicable to exchange on the premises all sections or portions of mechanism, save the brass casting, which is soldered to the meter. This is very desirable, for it reduces the work of the district complaint man to a minimum, and also avoids the necessity of removing the meter from the premises of the consumer. Another distinctly favorable point in connection with this device is its selling price. Manager Harrington is ready at any time to give full particulars respecting the device.

Items of Interest
FROM VARIOUS LOCALITIES.

SECRETARY STEINWEDELL informs us that the Gas Machinery Company, of Cleveland, O., has been authorized to install silica retorts and settings in the works at La Crosse and Waukesha, Wis.; and at Galesburg and Pontiac, Ills. President Plantinga declares that it has been cold enough through the northwest the past 7 weeks to cause the natives to believe that the Zuyder Zee district is mild as to atmospheric condition when compared to and with some sections in our "Great Northwest."

THE Humphrey Company, of Kalamazoo, Mich., the instantaneous water heater of which concern continues finding favor in this section of the country, has opened commodious quarters in 833 Chestnut street, Philadelphia, in which spacious apartment the Agent (Mr. Harry P. Dains), has a fine specimen, all hooked-up, ready to show to inquirers the device in good working operation. It is hardly necessary to say that a complete line of the Humphrey wares is carried.

WRITE to Mr. A. S. B. Little, General Manager, The Atlas Paint Company, of Nashville, Tenn., for a copy of "Bulletin, No. 10," which is neither more nor less than a splendid compilation of "Handy Tables for Gas Men." It is in size quite the thing; for it may be readily slipped into the pocket of a sack coat. If you get one, you'll keep it.

WITH much regret we chronicle the fact that a severe accident occurred to Mr. W. A. Aldrich, while travelling in a car of the Pere Marquette (Mich.) Railway. He was en route to Monterey, Mexico, at which point, as previously noted in the JOURNAL, he had engaged to construct a gas plant for the McKenzie-Mann Syndicate. To show, however, that the warrior bold remains undaunted, we take the liberty of quoting this paragraph from a letter written to us by him, dated Grand Rapids, Mich., the 5th inst.: * * * "However, my Doctor says I will be as good as ever by the end of the month. Then I will go to Mexico, revolution or not, for we have not very much time within which to complete the work." The most serious injury to his members was a broken leg, but what is that to Ald.?

MR. CHARLES GETMAN has interested a number of residents of Dolgeville, N. Y., in a project to there construct a gas plant. It is estimated that $50,000 will do to start with. This place is on the Little Falls and Dolgeville Railroad, at a point 12 miles northeast of Herkimer. It is quite a manufacturing center, some of the output being piano fixtures, felt shoes and caps. It has a popu lation of 2,900, and is very compactly centered.

"W. V. V.," writing under date of the 4th inst., incloses this mention: "I failed to see anything in our JOURNAL respect ing the formal organization of the Employees Mutual Benefit Association of the Milwaukee Railway and Light Company, and associated or controlled companies. It was effected the last week in February, and the formal organization bears the effective date of March 1st. The announcement of the plan for the new mutual benefit organization was made the 1st of January, coincident with the putting forward of the new pension and loan system, but time was required to prepare or formulate articles of incorporation and by-laws. Vice-President and General Manager J. D. Mortimer was Chairman *pro tem.*, and Bert. Hall acted as Secretary. The articles and by-laws were read, submitted and adopted. The Directors number 24, of whom 12 represent the Company and 12 the employees, and these Directors are charged with the duty of naming the executives in charge for the year ended Feb. 28, 1913. Close to 3,000 persons are entitled to hold membership in the Society, and up to the 2d inst., applications for such membership were in hand from 1,401. This organization differs from the general run of aid societies, in that the Company puts in a dollar for every dollar paid in by the employees. Your correspondent is under the impression that a like practice exists in the management of an Association of kindred nature that is maintained by your huge gas corporation in New York. The impetus given to this movement by the action of the Milwaukee Company toward us was simply great. You will hear from me again in this instance."

A CORRESPONDENT in Springfield, Mass., writing under date of the 11th inst., says: "Supt. Butler certainly has it on old 'Ben.' Butler for originality. While strolling through his town of Greenfield, Mass., I noticed a pipe, about 15 feet from the ground, running from a lunch wagon, and strung along the trees. At certain points supports had been erected which trailed back to the offices of the American Express Company at the Railroad Station. Upon investigation your correspondent determined that 265 feet of 1-inch pipe was furnishing gas to the Humphrey arcs along the line. The reason for all this air line of gas pipe was that the main leading into the station had been frozen solid, wherefore the aero line was of the temporary sort. Another 'stunt' of Mr. Butler's was when the conduit of the Telephone Company was put out of commission by the frost. Being anxious to draw in some lengths of cable 9 men worked ½ day with drills, and only gained 6 feet. As they were about to give it up, Mr. Butler suggested the use of a hose attached to an automatic water heater. This was done, and by affixing the hose to the rods used to push it into the conduit, the entire mass of ice (75 feet in length) the complete distance was cleaned in 2 hours and 30 minutes. As fast as the water and sloppy ice ran back the mess was pumped out of the manhole. All of which only goes to show one more use for the automatic, continuous hot water heater."

THE morning of the 2d inst. 26 employees of the Baltimore Consolidated Gas, Electric Light and Power Company were awarded service certificates in recognition of faithful and efficient service to the Company. It marked the putting forth of the pension system of the Company, adopted last fall, mention of which was made in the JOURNAL at the time. The certificate holders retire from the Company's service, but will be free to obtain other employment if they so desire, but they will receive for the remainder of their lives an annual sum determined by the length of their service and the average of their salaries for the past 10 years. There are three classes of men eligible for retirement under this provision. The first are those who have reached the age of 65, and who have been in the Company's employ for 15 years; second, those who have been continuously employed by the Company for 20 years and those who may have been disabled; third, those who may have been injuried while in the service of the Company, and who shall have served with the Company for 10 years. The retirement fund is provided entirely by the Company, and no contributions to it are permissible from any other source. The length of service of the first 26 men on the retired list was between 56 years and 15 years; the average being 36½ years. The veteran on the list is Mr. William H. Boesche, who entered the service of the old Baltimore Company (its plant was then on North Holiday street) in 1856, and whose service during all those years (56) was continuous. The gas rate in Baltimore was then $3.50 per 1,000 cubic feet; now the rate is 90 cents. A close second to the veteran is Mr. Daniel N. McCarty, whose work covers a period of 55 years. Nine others (one, 48 years; three, 47 years; two, 46 years; three 41 years) have served over 2 score years. It may be of interest in this connection to further note that the 11 veterans of the list served under these executive heads: Presidents, General Columbus O'Donnell, Mr. William Sinclair, Capt. John W. Hall, Gen. Fredinand C. Latrobe and Mr. J. E. Aldred; Engineers, Messrs. J. Newton Saunders, Chas. T. Dieterich, F. H. Hambleton and Geo. W. Beadenkopf. For courtesies in connection with this narrative we are indebted to the attention of Mr. H. K. Dodson.

MR. GEORGE HOUSMON has resigned from the service of the Mobile (Ala.) Gas Company to take up the important duties connected with the position of Sales' Manager to the New Orleans (La.) Gas Light Company. Mr. Housmon's successor at Mobile is Mr. R. B. Wright, who was Mr. Housmon's under-study since 1909.

THE Gribbel-Associates' purchase of the Tampa (Fla.) gas system is certainly leading on to great things. Right on the heels of the expenditure (rather expending, since the work of betterment is now in full swing) authorized on their assuming control comes the information that the appended rate schedule becomes operative the 1st prox.:

Quantity, per Month					Gross, per 1,000.	Net, per 1,000.
Up to 300 cubic feet (fixed quantity)					$0.56	$0.50
300	"	to 3,000	cubic	feet	1.75	1.57
3,000	"	" 10,000	"		1.67	1.50
10,000	"	" 20,000	"		1.57	1.41
20,000	"	" 40,000	"		1.47	1.32
40,000	"	" 80,000	"		1.37	1.23
80,000	"	" 100,000	"		1.26	1.13
Over 100,000 cubic feet					1.11	1.00

MR. JAMES RUHL has been appointed Manager of the Lewisburg (Pa.) Gas Company, vice Mr. H. C. Wolfe, resigned.

THE Central Indiana Gas Company, now in complete possession of the properties of the Alexandria (Ind.) Gas Company, promises to have artificial gas in that busy city in 6 weeks' time.

THE Rockville (Conn.) Gas and Electric Company is arranging to extend its distributing system to the outlying district of Tolland.

THE Mohawk Gas Campany (with the assent of the Public Service Commission for the District) has announced that the rate of $1, for gas supplied per 1,000 cubic feet in Schenectady, N. Y., will prevail as soon as the meter mechanisms can be adjusted. This means a concession of 20 cents per 1,000 cubic feet, which looks a low rate for the district concerned.

MR. R. E. BURGER, for some time Manager of the Fremont (Neb.) Gas, Electric Light and Power Company, has been appointed Manager of the Doherty lighting properties at Massillon, O. His successor at Fremont is Mr. W. H. Merritt, who had control of the Lebanon (Pa.) plant, and who was Secretary of the Pennsylvania Gas Association.

MR. GEORGE PHILIP SMYSER, well known for 2-score years in the business circles of Baltimore, Md., and York, Pa., died at his home in York, Pa., the morning of February 29th. He was in his 68th year, and was largely interested in the Pennsylvania gas corporations of Gettysburg and Hanover. He was a Knight Templar, was prominent in the ranks of the Mystic Shriners, and a powerful factor in the Lutheran church organization of Pennsylvania. He is survived by 2 daughters, 2 brothers and 2 sisters.

MR. WALTER VELTERS has severed all business relations with the Old Colony Gas Company, of Weymouth, Mass.

CLAWSON BACKMAN, W. S. Armstrong, J. T. Hayden and Lewis Burkhart, prominent in the management of the International Gas and Electric Company, which originally had its headquarters in Philadelphia, have been arrested, charged with conspiracy and embezzlement. Their cases will be tried in Philadelphia, the 23d inst., before Magistrate Harris.

The Market for Gas Securities.

There was shown during the week much more interest than usual respecting city gas shares. There was brisk trading in Consolidated Thursday and Friday, the quotation at noon of the latter being 141¾ to 142. This is, to all intent, a 2 point advance. The Sullivan bill is a dead one, and the legislative outlook on all sides is now distinctly favorable. The only fly in the ointment jar is the possible cost attending the fracturing of mains during the late unholy winter.

Brooklyn Union has advanced in even measure with Consolidated, and the appointment of a new Commercial Manager (in the person of Mr. T. M. Ambler) is evidence that the huge Brooklyn concern is going after in sensible fashion the trade in gas for cooking that has scarce been started on as yet. This may seem a queer assertion; but it is not. Dividends this week include: U. G. I. quarterly, 2 per cent., payable the 15th prox.; Cincinnati gas, quarterly, 1¼ per cent., payable 1st prox. A feature of the local bond market Thursday was the sale of $7,000 5's of the California Gas and Electric Company at 95¼ to 95½. The same day $6,000 N. Y. Gas, Electric Light, Heat and Power 5's were sold at 103¼. Here is a bit of an inside tip, it would seem. If these 5's are worth well over par now, doesn't it seem possible, when that concern takes over the Consolidated properties later on, its shares should be worth (right at the go-off) 75 cents on the dollar? Well, it rather so seems.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

MARCH 18.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co.	$78,177,000	100	141¾	142
Central Union Gas Co.—1st 5's, due 1972, J. & J.	3,000,000	1,000	103	105
Equitable Gas Light Co.—Con. 5's, due 1932, M. & S.	1,000,000	1,000	105	106
Mutual Gas Co.	3,500,000	100	165	175
New Amsterdam Gas Co.—1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	101	102½
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	35	50
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98¼	100½
New York and East River—1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	95	100
Northern Union—1st 5's, due 1927, J. & J.	1,250,000	1,000	100	109
Standard	5,000,000	100	60	70
Preferred	5,000,000	100	90	100
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	103	105
The Brooklyn Union	15,000,000	1,000	141	142
1st Con. 5's, due 1948, M. & N.	15,000,000	—	106¼	107
Yonkers	299,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	½	¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	—
" 1st Mtg. 5's	500,000	1,000	97	100
Boston United Gas Co.—1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
Bonds, 5's	5,250,000	1,000	59	60
Capital, Sacramento	500,000	50	—	85
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,660,000	1,000	104	106¼
Cincinnati Gas and Electric Co.	29,500,000	100	87	90
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	96	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	90¼	91
Preferred	3,026,500	100	75½	80
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	13,460,084	—		—
Mortgages, 5's	3,400,000	—		—
General Mortgage 4½	10,661,000	—		—
Con. Gas Co., Baltimore City, 4½	2,751,000	—		—
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	94	96
Bonds	75,000	—	—	100
Essex and Hudson Gas Co.	6,500,000	—	133	136
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Light Co., 1st Mtg. 5's	1,350,000	1,000	100	101
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	130	138
" Bonds, 5's	10,500,000	—	101	106
Indianapolis	2,000,000	—	—	38
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	50	82	—
" 1st Mtg. 5's	290,000	1,000	91	95
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,822,000	1,000	99	102
Laclede Gas Co., St. Louis.	10,000,000	100	104¾	105¼
Preferred	2,500,006	100	114	120
Bonds	10,000,000	1,000	102¾	103
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,370,000	50	142	145
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	106	108¾
Massachusetts Gas Companies, of Boston	25,000,000	100	92½	92¾
Preferred	25,000,000	100	97½	97¾
Montreal Gas Co., Canada	2,000,000	100	218	218¾
Nashville Gas Light Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	97	98
Bonds, 6's	6,000,000	—	127	128
New Haven Gas Co.	2,000,000	25	200	—
Peoples Gas Lt. & Coke Co., Chicago	25,000,000	100	106¾	107
1st Mortgage	20,100,000	1,000	102	102½
2d "	2,500,000	1,000	104	—
Rochester Gas & Electric Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104¾	105½
Pacific Gas and Electric Co.	15,500,000	—	53¾	55
St. Joseph Gas Co.—1st Mtg. 5's	1,000,000	1,000	94	98

DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS., PHILADELPHIA, Mar. 13, 1912.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable April 15, 1912, to stockholders of record at the close of business, Mar. 30, 1912. Checks will be mailed.

1919-4 LEWIS LILLIE, Treasurer.

MEETING TIMES OF THE VARIOUS GAS ASSOCIATIONS.

American Gas Institute.—Annual meeting, October 16 to 18, 1912. Atlantic City, N. J. Officers: President, Ira C. Copley, Aurora, Ills. Secretary, Geo. G. Ramsdell, 29 West 39th st., N. Y. City.

Canadian Gas Association.—Annual meeting, ———— Officers: President, Arthur Hewitt, Toronto, Ont.; Secretary and Treasurer, John Keillor, Hamilton, Ont.

Empire State Gas and Electric Association.—Annual meeting, New York City, Oct. 1912. Officers: President, R. M. Searle, Rochester, N. Y.; Secretary, C. H. B. Chapin, 29 W. 39th street. New York City.

Gas Meters.—Monthly meetings. Chairman, I. W. Peffly; Secretary, H Thurston Owens, 42 Pine street, New York City.

Guild of Gas Managers of New England.—Annual meeting, March, 1913. Young's Hotel, Boston; monthly meeting, second Saturday. Officers: President, Walter G. Africa, Manchester, N. H.; Secretary, H. K. Morrison, Brockton, Mass.

Illinois Gas Association.—Annual meeting, time, March 20 and 21, 1912, Auditorium Hotel, Chicago, Ills. Officers: President, C. B. Strohn, Elgin, Ills.; Secretary-Treasurer, F. E. Newberry, Dixon, Ills.

Illuminating Engineering Society.—Annual meeting, Sept. ————1912, ———— Meetings of Sections, monthly. Pres't, V. B. Lansingh, New York City; Secretary, Preston S. Millar, 29 W. 39th street, N. Y. City. Sections: New York, Secretary, Albert J. Marshall, 16 East 40th street. New England, Secretary, H. C. Jones, 10 High street, Boston, Mass. Philadelphia, Secretary, L. B. Eichengreen, Broad and Arch streets. Chicago, Secretary, Edward Wray, 105 N. LaSalle street.

Indiana Gas Association.—Annual meeting, March, 1913, Indianapolis. Officers: President, Howard L. Olds, Indianapolis; Vice-President, Wm. Wallace, Lafayette; Secretary-Treasurer, Phimer Eves, Indianapolis.

Iowa District Gas Association.—Annual meeting, time, May, 22, 23 and 24, 1912; Lincoln, Neb. Officers: President, G. W. Clabaugh, Omaha, Neb.; Secretary and Treasurer, G. I. Vincent, Des Moines, Ia.

Kansas Gas, Water and Electric Light Association.—Annual meeting, time, Oct. 17-19. Manhattan, Kas. Officers: President, B. F. Eyer, Manhattan, Kas.; Secretary and Treasurer, J. D. Nicholson, Newton, Kas.

Michigan Gas Association—Annual meeting, time, Sept. ————1912;———— Officers: President, F. W. Blowers, Kalamazoo, Mich; Secretary-Treasurer, Glenn R. Chamberlain, Grand Rapids, Mich.

Missouri Electric Light, Gas, Water Works and Street Railway Association.—Annual meeting, April 11-13, 1912; Joplin, Mo. Officers: President, F. E. Murray, Louisiana, Mo.; Secretary and Treasurer, N. J. Cunningham, Springfield, Mo.

National Commercial Gas Association.—Annual meeting, Dec. 2-5, 1912. Atlanta, Ga. Officers: President, C. L. Holman, St. Louis, Mo.; Secretary, Louis Stotz, 29 West 39th street, New York City.

Natural Gas Association.—Annual meeting, May, 1912, Kansas City, Mo.; Officers: President, A. B. Macbeth, Independence, Kas, Secretary, T. C. Jones, Delaware, O.

New England Gas Association.—Annual meeting, February,————1913. Boston. Officers: President, D. D. Barnum, Worcester, Mass.; Secretary-Treasurer, N. W. Gifford, East Boston, Mass.

New Jersey State Gas Association.—President, William H. Pettes, Newark, N. J.; Secretary-Treasurer, Arthur H. Osborn, Belmar, N. J.

Ohio Gas Association.—Annual meeting, February ———, 1913, Columbus, O.; President, John M. Garard, Columbus, O.; Secretary, L. B. Denning, Columbus, O.

Oklahoma Gas, Electric and Railway Association.—President, Noel R. Gascho, Alva Okla.; Secretary, H. V. Bozell, Norman, Okla.

Pacific Coast Gas Association.—Annual meeting, San Diego, Cal., September 17, 18, 19, 1912. Officers: President, W. Baurhyte, Los Angeles, Cal.; Vice President, Henry E. Adams, Stockton, Cal.; Secretary-Treasurer, John A. Britton, 445 Sutter street, San Francisco, Cal.

Pennsylvania Gas Association.—Annual meeting, Williamsport, Pa., April 10-12, 1912. Officers, President, W. R. Rhodes, Williamsport, Pa.; Secretary-Treasurer, W. O. Lamson, Jr., West Chester, Pa.

Society of Gas Lighting.—Annual meeting, Dec., 13, 1912; monthly meeting, second Thursday. Place, New York City. Officers: President, Fred. S. Benson; Secretary, George G. Ramsdell, 29 West 39th street, New York city

Southern Gas Association.—Annual meeting, April 17-19, 1912, Jacksonville, Fla. Officers: President, H. B. Hoyt, Jacksonville, Fla.; Secretary-Treasurer, E. D. Brewer, Atlanta, Ga.

Southwestern Electrical and Gas Association.—Annual meeting. April 25, 26, 27, 1912, San Antonio, Tex. Officers: President, J. E. Carroll, Beaumont, Tex.; Secretary, D. G. Fisher, Dallas, Tex.

Wisconsin Gas Association.—Annual meeting, May 15 and 16, 1912, Milwaukee, Wis. Officers: President, H. M. Buck, Waukesha, Wis.; Secretary-Treasurer, Henry Harmon, Milwaukee, Wis.